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Türk Uyku Tıbbı Dergisi, Türk Uyku Tıbbı Derneği'nin resmi yayın organıdır.
Journal of Turkish Sleep Medicine is an official journal of the Turkish Sleep Medicine Society.

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Amaç ve Kapsam

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Türk Uyku Tıbbı Derneği'nin süreli resmi yayını olarak 2014 yılında yayın hayatına başlamıştır. Dergi türkçe ve/veya ingilizce olarak; uyku tıbbını, uyku ile ilgili temel klinik ve sosyolojik konuları ve uyku ve biyolojik ritimleri işleyen olgu sunumu, araştırma yazısı ve derleme türündeki yazıları kabul etmektedir. Yazarlardan hem türkçe hem de ingilizce özet istenmektedir. Dergide yayımlanacak olan makaleler bağımsız ve önyargısız çift-kör hakemlik ilkeleri ile değerlendirilmektedir. Yılda dört sayı (Mart, Haziran, Eylül sayıları ile Aralık kongre özel sayısı) online olarak yayınlanmaktadır.

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Web of Science-Emerging Sources Citation Index (ESCI), EBSCO Database, British Library, Index Copernicus, CINAHL Complete Database, DOAJ, ProQuest Health & Medical Complete, Gale, J-Gate, IdealOnline, ROOT INDEXING, Türk Medline, Hinari, GOALI, ARDI, OARE ve Türkiye Atıf Dizini ve Türk Tıp Dizini'nde indekslenmektedir.

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Dergide "açık erişim politikası" uygulanmaktadır. Açık erişim politikası, Budapest Open Access Initiative (BOAI) http://www.budapestopenaccessinitiative.org kuralları esas alınarak uygulanmaktadır.

Açık erişim; hakem değerlendirmesinden geçmiş bilimsel literatürün; internet aracılığıyla, finansal, yasal veya teknik engeller olmaksızın, serbestçe erişilebilir, okunabilir, indirilebilir, kopyalanabilir, dağıtılabilir, basılabilir, taranabilir, tam metinlere bağlantı verilebilir, dizinlenebilir, yazılıma veri olarak aktarılabilir ve her türlü yasal amaç için kullanılabilir olmasıdır. Çoğaltma ve dağıtım üzerindeki tek kısıtlama yetkisi ve bu alandaki tek telif hakkı; kendi çalışmalarının bütünlüğü üzerinde kontrol sahibi olabilmeleri, gerektiği gibi tanınmalarının ve alıntılanmalarının sağlanabilmesi için yazarlara verilmektedir.

Yazarlara Bilgi

"Yazarlara Bilgi" bölümüne derginin http://jtsm.org internet adresinden ulaşılabilir.

Materyal Sorumluluk Reddi

Yayımlanan yazıların bilimsel ve hukuki sorumluluğu yazarlarına aittir. Yazıların içeriğinden ve kaynakların doğruluğundan yazarlar sorumludur. Türk Uyku Tıbbı Derneği (TUTD), editörler kurulu ve yayıncı; dergide yayımlanan eserler için herhangi bir sorumluluk kabul etmez.

Derginin mali giderleri Türk Uyku Tıbbı Derneği (TUTD) tarafından karşılanmaktadır.

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Aims and Scope

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi) started in 2014 as the official periodic publication of Turkish Sleep Medicine Society. The Journal accepts case reports, research articles and review articles on basic clinical and sociological issues, dealing with sleep medicine in turkish and/or english. The authors are required to provide abstracts in both english and turkish. An independent, unbiased double peer-reviewed principle is used to select manuscripts for publication. Four issues are published online in a year (issues in March, June, September and special congress issue in December).

Journal of Turkish Sleep Medicine is indexed in Web of Science-Emerging Sources Citation Index (ESCI), EBSCO Database, CINAHL Complete Database, DOAJ, Gale, Index Copernicus, ProQuest Health & Medical Complete, British Library, J-Gate, ROOT INDEXING, IdealOnline, Turk Medline, Hinari, GOALI, ARDI, OARE and Turkiye Citation Index.

Open Access Policy

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

Open access policy is based on rules of Budapest Open Access Initiative (BOAI) http://www.budapestopenaccessinitiative.org by "open access" to peer-reviewed research literature, we mean its free availability on the public on internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited.

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Financial expenses of the journal are covered by Turkish Sleep Medicine Society (TSMS).

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Yazarlara Bilgi

Yazar Kılavuzu

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi) için göndereceğiniz eseri hazırlarken; aşağıda yer alan, size yardımcı olacak yönergeleri dikkatle okumanız önerilir. Herhangi bir sorunuz olması durumunda bizimle iletişime geçmekten çekinmeyiniz. Gözden geçirme ve yayımlanma işlemlerini hızlandırmak amacıyla, yönergelere uymayan makaleler gözden geçirme işleminden önce teknik düzeltmelerin yapılması için iletişim kurulacak yazara geri gönderilir.

İçerik

1. Dergi Hakkında

Journal of Turkish Sleep Medicine (Türk Uyku Tıbbı Dergisi), Türk Uyku Tıbbı Derneği'nin süreli resmi yayın organıdır. Yayın dili türkçe ve ingilizce olan; uyku ile ilgili temel klinik ve sosyolojik konuları ve uyku ve biyolojik ritimleri işleyen özgün araştırma makalelerini, olgu sunularını ve derleme türündeki yazıları yayımlar. Dergide yayımlanacak eserlerde yazar olmak için TUTD üyesi olma şartı aranmaz.
Dergide makale başvuru ücreti veya makale işlem ücreti uygulanmamaktadır.
Sıklık: Yılda dört sayı (mart, haziran, eylül sayıları ve aralık kongre özel sayısı)
E-ISSN: 2757-850X
Dergi Adı Kısaltması: J Turk Sleep Med
Yayıncı: Galenos Yayınevi

2. Editör İncelemesi ve Yayıma Kabul

→ Makale İnceleme Süreci: Dergiye gönderilen makale; konusuna göre, yardımcı editörlerden birine gönderilir. Sorumlu yardımcı editör, makaleyi incelemesi için en az iki adet hakemi görevlendirir ve hakemlerin yorumlarına göre makalenin yayımlanmasına, revizyonuna veya reddedilmesine 4-6 hafta içinde karar verir.

→ Yayıma Kabul: Tüm eserler için yayıma kabul kriterleri arasında; sunulan araştırmanın kalitesi, özgünlüğü ve derginin okuyucuları için dikkate değer olması yer alır. Tüm makaleler sırasıyla gözden geçirilir. Editör herhangi bir materyali yayımlamayı reddetme hakkına sahiptir. Makalenin kabul olması veya reddedilmesi ile ilgili son karar Yayın Kurulu'na aittir.

→ Makalenin Yayımlanmasından Önce: Tüm makaleler açık, öz ve anlaşılır bir biçimde yazılmalıdır; böylece makalenin yazıldığı alanda uzman olmayan profesyonel okuyucular tarafından da anlaşılabilir olması sağlanmalıdır. İçeriği bakımından yayımlanabilir olduğuna karar verilen eserler için editörler, makaledeki anlam belirsizliklerini ve tekrarları gidermek ve yazar ile okuyucu arasındaki iletişimi geliştirmek amacıyla makalede değişiklik yapabilir. Eğer kapsamlı değişiklik yapılması gerekiyor ise eserler düzeltme için yazarlara geri gönderilir.

3. Makale Kategorileri

→ Özgün Makale: Temel veya klinik konular üzerine güncel araştırmaların ayrıntılı bir biçimde sunulmasıdır.

• Kelime Sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 6000 kelime.
• Özet: En fazla 250 kelime, yapılandırılmış (giriş, amaç, gereç yöntem, bulgular, sonuç altbaşlıkları ile).
• Şekiller/Tablolar: En fazla 2 adet.
• Referanslar: En fazla 30 adet.

→ Kısa Yazı: Araştırmaları veya klinik uygulamaları önemli ve hızlı bir şekilde etkileyen yeni buluşları içerir. Olgu sunumlarını içermez.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 1800 kelime.
• Özet: En fazla 100 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: En fazla 5 adet.
• Referanslar: En fazla 10 adet.

Kısa yazılar için destekleyici bilgilere izin verilmemektedir.

→ Olgu Sunumu: Ender görülen, ilginç klinik vakalar ve yenilikler yayımlanmak için dikkate alınır. Editör; uygun görmesi durumunda, yazarlardan olgu sunumunu "Editöre Mektup" formatında tekrar yazılmasını isteyebilir.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 1200 kelime.
• Özet: En fazla 100 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: En fazla 2 adet.
• Referanslar: En fazla 10 adet.

→ Editöre Mektup: Herhangi bir tartışma konusunda yazılmış mektuplar (klinik gözlemler, son çıkan sayılarda yayımlanan yazılara yapılan yorumlar vb.) editöre gönderilebilir. Bu yazılar da editör incelemesine tabidir. Mektuplarda isteğe bağlı bir başlık kullanılabilir. Yazarların söz konusu mektuplara verdikleri yanıtlarda mektubun başlığı belirtilmelidir (Örn. Makalenin Başlığı'na yanıt olarak). Bu, okuyucuların tartışmanın hatlarını takip edebilmelerini sağlayacaktır.

• Kelime sınırı: En fazla 500 kelime.
• Özet: Özet içermez.
• Şekiller/Tablolar: En fazla 1 adet.
• Referanslar: En fazla 5 adet.

→ Derleme Makalesi: Anket, güncel araştırmaların değerlendirmeleri ve eleştirel yorumlamaları, derginin kapsadığı alanlardaki veri ve kavramları içeren derleme makalelerini içerir.

• Kelime sınırı: Özet hariç olmak üzere tablo, şekil ve referanslar dahil en fazla 8000 kelime.
• Özet: En fazla 250 kelime, yapılandırılmamış (alt başlıklar kullanılmadan).
• Şekiller/Tablolar: Resimler, şekiller veya tablolar başka bir kaynaktan alınarak kullanıldıysa telif hakkı sahibinden (genellikle yayınevi) materyali çoğaltmak için izin verildiğini belirten bir mektubun 'üst yazı' ile birlikte gönderilmesi gerekmektedir.

→ Editör Notu: Bir makale veya bilgi güncellemesi hakkında görüş notu editör tarafından davet edilir.

• Kelime sınırı: En fazla 1500 kelime.
• Özet: Özet içermez.
• Referanslar: En fazla 5 adet.

4. Makale Gönderimi

Makaleler aşağıdaki adresten online olarak gönderilmelidir:
https://www.journalagent.com/jtsm
İnternet sitesini kullanırken veya makale ile ilgili herhangi bir sorun olması durumunda teknik yardım için lütfen Galenos Yayınevi veya Editörler Kurulu ile iletişime geçiniz.
Tüm yazışmalar e-posta yoluyla yapılacağından dolayı yazarlar e-posta adreslerini belirtmelidir.
Makale gönderimi yapılırken sorumlu yazarın ORCID ID (Open Researcher and Contributor ID) numarası belirtilmelidir. ORCID ID edinmek için http://orcid.org adresinden ücretsiz olarak kayıt oluşturulabilir.

→ Dergiye gönderilen tüm makaleler bu kurallara uymalıdır. Aksi takdirde makale yazara geri gönderilir ve yayımlanması gecikir.

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Yazarlara Bilgi

• Bir paragraf içinde satırların sonunda "enter" tuşu kullanılmamalıdır.
• Heceleme seçeneği kapalı tutulmalı, sadece anlam için gerekli olan durumlarda "tire" kullanılmalıdır.
• Türkçe veya ingilizce olmayan karakterleri temsil etmek için kullanılan özel karakterler açıkça belirtilmelidir.
• 1 (bir) yerine I (le), 0 (sıfır) yerine O (büyük harf o) veya β (Yunancada beta) yerine ß (Almanca Eszett harfi) kullanılmamalıdır.
• Tablolarda veri göstergelerini ayırmak için boşluk yerine "tab" tuşu kullanılmalıdır. Tablo düzenleme fonksiyonu kullanıldıysa her bir veri göstergesinin tek bir hücrede olduğundan emin olunmalıdır. (örn. Hücreler içinde satırbaşı komutu kullanılmamalıdır)

→ Yazarlar 'üst yazı'yı başlık sayfasından ayrı olarak hazırlamalıdır. Makalenin içeriğinin bilimsel toplantı veya sempozyumda kısa özet şeklinde sunulmanın haricinde; daha önce başka bir yerde yayımlanmamış veya yayımlanmak üzere gönderilmemiş olduğu bu yazıda beyan edilmelidir. Üst yazıda ayrıca tüm yazarların makalenin içeriği hakkında fikir birliği içinde olduklarının belirtilmesi gerekmektedir. Tüm yazarların makale gönderiminden önce Makale Merkezi'ne kaydedilmesi gerekmektedir.

Yazarlar ayrıca araştırma projesinin bir "Etik Komite" tarafından onaylandığını, onay numarası ile birlikte belirtmelidir (bkz. Etik Konular). Bu bilgi, araştırmanın "Gereç ve Yöntem" bölümünde belirtilmelidir. İnsan deneylerinde yazarlar, 1964 yılı Helsinki Bildirgesi (2013 yılı Edinburg'da revize edilmiş hali ile) hükümlerine uymalıdır ve çalışmanın katılımcılarının bilgilendirilmiş olur verdiklerine dair bir ifade eklemelidir. Hasta kimliğinin gizli kalması sağlanmalıdır. Klinik araştırmalarda yazarlar çalışma kaydının adını ve kayıt numarasını üstyazıda bildirmelidir. Kaydedilmemiş bir klinik deneyde neden kayıt yapılmadığı açıklanmalıdır.

5. Makalenin Yapısı

Makalenin uzunluğu "Makale Kategorileri" bölümündeki şartlara uymalıdır. Belirtilen yönergelere uymayan makaleler, incelemeye başlanmadan önce teknik düzeltmelerin yapılması için iletişim kurulacak yazara geri iletilecek ve makale yayım için gönderilmemiş sayılacaktır.

Makaleler belirtilen sırayla sunulmalıdır: Başlık sayfası, özet ve anahtar kelimeler, metin, teşekkür ve beyanlar, referanslar, resim ve şekiller, tablolar, denklemler. Metine dipnot verilmemelidir, bu tür notlar metinde parantez içinde belirtilmelidir.

→ Başlık Sayfası: Şunları içermelidir;
• Makalenin kategorisi
• Makalenin başlığı
• Makalenin kısa başlığı
• Yazarların tam adları ve kurumları
• Çalışmanın yapıldığı kurumun adresi
• İletişim kurulacak yazara ait tam posta ve e-posta adresleri, faks ve telefon numaraları
• Kelime sayısı

Başlık 120 karakterden az olmalıdır. Başlıkta REM, DNA gibi yaygın kullanılan kısaltmalar dışında kısaltma kullanılmamalıdır. Boşluklar dahil 40 karakteri aşmayacak bir kısa başlık da belirtilmelidir.

→ Özet ve Anahtar Kelimeler: "Makale Kategorileri" bölümündeki koşullara uymalıdır. Özette yaygın kullanılan kısaltmalardan başka kısaltma veya referans yer almamalıdır. Anahtar kelimeler özet bölümünün altında yer almalı ve 3-7 adet olmalıdır.

→ Metin: Yazarlar makalenin bölümlerini belirtilen sıra ile oluşturmalıdır: Giriş, Gereç ve Yöntemler, Bulgular, Sonuç. Lütfen bu koşulların makale tipine göre değişiklik gösterdiğini unutmayınız ve "Makale Kategorileri" bölümünü tekrar gözden geçiriniz.

→Teşekkür ve Beyanlar: Yazarlar çıkar çatışması yaratabilecek herhangi bir finansal destek veya ilişkiyi beyan etmelidir. Finansal bağış veya diğer fon yardımlarının kaynağını bildirmelidir. Yazarlar finansal beyanda bulunmak ve olası çıkar ilişkilerini açıklamak için sunulan seçenekleri rehber olarak kullanabilir: İstihdam/liderlik konumu/danışmanlık rolü, hisse sahibi, patent telifleri/lisans ücretleri, honoraryum (örn. ders ücretleri), promosyon malzemeleri ücretleri (örn. makale ücretleri), araştırma fonu veya diğer (örn. araştırma ile ilgili olmayan gezi, seyahat veya hediyeler).

→ Referanslar: Vancouver sistemi kullanılmalıdır: http://barrington.cranfield.ac.uk/help/vancouver-system-for-citing-references. Metin içinde referanslara üst simge normal rakamlar kullanılarak geçiş sırasına göre atıfta bulunulmalıdır. Eğer sadece tablo veya şekil başlıklarında atıfta bulunuluyorsa tablo veya şeklin metinde ilk geçtiği yere göre numaralandırılmalıdır. Referans listesinde referanslar metindeki geçiş sırasına göre numaralandırılmalı ve listelenmedir. Referans listesinde tüm yazar adları yer almalıdır. Yayımlanmamış veri ve kişisel iletişimler listede yer almamalıdır, bunlara sadece metin içinde atıfta bulunulmalıdır (Örn. Smith A, 2000, yayınlanmamış veri).

1) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Apnea Syndrome in Acromegaly Before and After Treatment. JTSM 2014;1:22-7.
2) Ernstoff M. Urologic Cancer. Black-well Science, Boston,1997.
3) Gilchrist RK. Further commentary: Continent stroma. In: King LR, Stone AR, Webster GD (eds). Bladder Reconstruction and Continent Urinary Diversion. Year Book Medical, Chicago, 1987;204-5.

DOI kullanan standart dergi makaleleri; cilt, sayı veya sayfa sayısı almadan önce online olarak yayınlanan makaleler (DOI hakkında daha fazla bilgi için: http://www.doi.org/faq.html):

4) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Apnea Syndrome in Acromegaly Before and After Treatment. JTSM İnternet ağı üzerinde yayınlandığı tarih 30 Mart 2014; doi: 10.1111/j.1479-8425.2008.00379.x

→ Resim ve Şekiller: Başlıkları resim ve şekilden ayrı olarak belirtilmelidir. El çizimleri ve fotoğraflar dahil tüm çizimler resim veya şekil olarak sınıflandırılır. Resim ve şekillere metinde sırayla atıfta bulunulmalıdır. Her bir resim-şekil ayrı bir dosya olarak hazırlanmalıdır ve resim-şekil numarası dosya adında yer almalıdır. Makale inceleme işlemi sırasında aktarmayı kolaylaştırmak için .jpg veya .bmp olarak kaydedilmiş düşük çözünürlükteki resim-şekillerin gönderilmesi uygundur. Makalenin kabulünden sonra yayın için yazarlardan resim-şekillerin daha yüksek çözünürlüklü halleri talep edilebilir.
• Boyut: Resim-şekil boyutları tek sütuna sığmalı (82 mm), orta boyutta olmalı (118 mm) veya tam metin boyutuna sığmalıdır (173 mm).
• Çözünürlük: Resim-şekiller yüksek çözünürlüklü .eps veya .tif dosyaları olarak hazırlanmalıdır.
• Koşullar: Yarım ton resim-şekiller 300 dpi (dots per inch), renkli resim-şekiller 300 dpi ve RGB (kırmız, yeşil, mavi) modu yerine CMYK (cam göbeği, mor pembe, sarı, siyah) modunda ayarlanmış olarak kaydedilmiş şekilde, yazı içeren resim-şekiller 400 dpi, çizim halindeki şekiller 1000 dpi. şeklinde düzenlenmelidir.
• Çizim şekilleri: Profesyonel olarak veya bir bilgisayar grafik paketi ile çizilmiş keskin siyah veya beyaz grafikler veya diyagramlar şeklinde olmalıdır.
• Resim veya şekillerdeki metin boyutları: Yazı karakteri eklenmelidir. Derginin yazı boyutundan veya 8 puntodan daha büyük olmamalıdır. (Resim-şekillerin indirgenmesinin ardından yazı hala okunabiliyor olmalıdır.)
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Yazarlara Bilgi

→ Denklemler: Normal rakamlarla sıralı olarak numaralandırılmalıdır. Bunlar, parantez içinde sağ tarafta verilmelidir. Tüm değişkenler italik olarak belirtilmelidir. Örn.

dx/dt = c (x – x2/3 + y + z) (1)

DY/DT = –(X + BY – A)/C (2)

Ek Bilgi: Bulgular ile yakından ilgili olan destekleyici bilgiler yer alabilir.

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→ Kısaltmalar: Kısaltmalar az miktarda kullanılmalıdır. Öncelikle ifadenin açık hali ardından parantez içinde kısaltması belirtilmelidir. DNA gibi yaygın kullanılan kısaltmalar açıklaması olmadan kullanılabilir.

→ Marka İsimleri: İlaçlar ve kimyasallar marka isimleriyle verilmemelidir. Çalışmada tescilli ilaçlar veya kimyasallar kullanıldı ise jenerik isimleriyle belirtilerek parantez içinde marka adı ve tedarikçi firmanın adı ve yeri belirtilmelidir.

Yayın Politikası ve Makale Yazım Kuralları, International Committee of Medical Journal Editors (ICMJE) tarafından sunulan "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (ICMJE Recommendations)" (http://www.icmje.org) temel alınarak hazırlanmıştır.

Araştırma makalelerinin hazırlığı, sistematik derlemeleri, meta-analizleri ve olgu sunumları ise uluslararası kılavuzlara uygun olmalıdır:

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• Sistematik derleme ve meta-analizlerin raporlamaları için; PRISMA (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097) (http://www.prisma-statement.org).

• Tanısal değerli çalışmalar için; STARD (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al, for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4) (http://www.stard-statement.org).

• Gözlemsel çalışmalar için; STROBE (http://www.strobe-statement.org).

• Meta-analizleri ve gözlemsel çalışmaların sistematik derlemeleri için; MOOSE (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting "Meta-analysis of observational Studies in Epidemiology" (MOOSE) group. JAMA 2000; 283: 2008-12).

• CARE kılavuzları, olgu sunumlarının doğruluğunu, şeffaflığını ve yararlılığını artırmak için tasarlanmıştır. (Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; the CARE Group. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development.) (http://www.care-statement.org)

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Sayfa dizgi düzeltmelerini içeren PDF (Portable Document Format) dosyasının indirilebileceği linke ait adresin bildirimi, gerekli formlar ve daha fazla açıklamalar iletişim kurulacak yazara e-posta yoluyla gönderilecektir. PDF düzeltmesinin amacı makalenin düzeninin, tabloların ve şekillerin son kontrolünü sağlamaktır. PDF düzeltmesi aşamasında hataların çok gerekli düzeltmeleri dışındaki değişikliklere izin verilmemektedir.

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Contents

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Scope Journal of Turkish Sleep Medicine is the official turkish and english language journal of the Turkish Sleep Medicine Society (TSMS), and publishes original research articles, articles, case reports and review articles on basic clinical and sociological issues, dealing with Journal of sleep medicine. Both members and non-members of the TSMS are welcome to submit papers to the journal.

The journal does not charge any article submission or processing charges.

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1) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Ap-nea Syndrome in Acromegaly Before and After Treatment. JTSM 2014;1:22-7.
2) Ernstoff M. Urologic Cancer. Black-well Science, Boston.1997.
3) Gilchrist RK. Further commentary: Continent stroma. In: King LR, Stone AR, Webster GD (eds). Bladder Reconstruction and Continent Urinary Diversion. Year Book Medical, Chicago, 1987;204-5.

Standard journal articles using DOI; articlespublished online in advance without volume, issue, or page number (More information about DOIs: http://www.doi.org/faq.html):

4) Korkmaz S, Cakir D, Bayram F, Karaca Z, Ismailogullari S, Aksu M. Obstructive Sleep Ap-nea Syndrome in Acromegaly Before and After Treatment. JTSM Published online 30 March 2014; doi: 10.1111/j.1479-8425.2008.00379.x

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• PRISMA statement of preferred reporting items for systematic reviews and meta-analyses (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097.) (http://www.prisma-statement.org),

• STARD checklist for the reporting of studies of diagnostic accuracy (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al., for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4.) (http://www.stard-statement.org),

STROBE statement, a checklist of items that should be included in reports of observational studies (http://www.strobe-statement.org),

• MOOSE guidelines for meta-analysis and systemic reviews of observational studies (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting Meta-analysis of observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283: 2008-12),

• CARE guidelines are designed to increase the accuracy, transparency, and usefulness of case reports. (Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; the CARE Group. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development.) (http://www.care-statement.org)

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Journal of Turkish Sleep Medicine 2022;9:1-4

Zihinsel Engelli Çocuklar ve Annelerinde Uyku Sorunları ve Çözüm Önerileri

Suggested Solutions for Sleep Problems in Children with Intellectual Disabilities and Their Mothers

Çiğdem Müge Haylı

Hakkari Üniversitesi Sağlık Bilimleri Fakültesi, Hemşirelik Anabilim Dalı, Hakkari, Türkiye

Öz

Uyku bütün canlılar için zorunlu olan hava, su ve yiyecek gibi temel fizyolojik bir gereksinimdir. Özellikle çocuklar için uyku, büyüme ve gelişme açısından önemlidir. Uyku sorunları, çocukların genelinde özellikle de zihinsel engelli çocuk ve annelerinde fizyolojik, psikolojik ve sosyal boyutlarda büyük bir sorun oluşturmaktadır. Zihinsel engelli çocuklar ve annelerini olumsuz etkileyen uykuya yönelik sorunların bilinmesi ve buna yönelik önlem alınması gerekmektedir. Bu derlemenin amacı, uykunun tanımlanmasını, zihinsel engelli çocuklar ve annelerinin uyku sorunları ile bu sorunlara yönelik çözüm önerilerini sağlamaktır.

Anahtar Kelimeler: Uyku, uyku sorunları, zihinsel engelli çocuk, anneler, çözüm önerileri

Abstract

Similar to essential air, water, and food, sleep is a basic physiological requirement for all living beings. Sleep is essential for growth and development in children. Sleep problems are considered to be a major challenge in physiological, psychological, and social dimensions, especially for children with intellectual disabilities as well as their mothers. Therefore, understanding and taking appropriate measures is necessary to address sleep problems that negatively affect these children and their mothers. This review aimed to identify sleep problems and provide solutions for children with intellectual disabilities and their mothers.

Keywords: Sleep, sleep problems, child with intellectual disabilities, mothers, solution suggestions

Giriş

Zihinsel engellilik; kronik hastalıklarda olduğu gibi, bireylerde kalıcı olarak yetersizliklere neden olan, yaşamı boyunca kişiyi ve çevresini etkileyen sosyal, duygusal, davranışsal ve bilişsel yönlerden etkileyen bir sorun olup her toplumda yaklaşık olarak %4-5 oranında görülmektedir (1). Dünya Sağlık Örgütü; ortalama olarak bir milyardan fazla engelli birey olduğunu ve bunun 200 milyonunun zihinsel engelli bireylerden oluştuğunu bildirmektedir (2,3). Zihinsel engelli çocukların engellerinin yanı sıra birçok fiziksel, psikolojik ve sosyal sorunlar yaşadığı bilinmektedir (4). Bu sorunların arasında beslenme güçlükleri, epilepsi, zihinsel engellikten kaynaklı sağlık ve uyku sorunlarının eşlik etmesi yaygın olarak görülmektedir (5).

Uyku, canlıların çevresiyle iletişimin ve etkileşimin farklı uyaranlarla geri döndürülebilir biçiminde geçiçi olarak kaybolması durumudur (6). Türk Dil Kurumu'na göre; ''Dış uyaranlara karşı bilincin, bütünüyle veya bir bölümünün yittiği, tepki gücünün zayıfladığı ve her türlü etkinliğin büyük ölçüde azaldığı dinlenme durumu'' olarak tanımlanmaktadır (7). Ayrıca, organizmanın canlının dış tepkimelere cevap eşiğinin yükseldiği, geri dönüşümü olan bir süreçtir (8). Sağlıklı uyku genel sağlığı, okul öğrenimi, emosyonel durumu, davranışlarının düzenlenmesi, biyolojik, fiziksel ve zihinsel sağlığının korunmasına yardımcı olur (8). Uyku sorunları her yaşta görülmekle birlikte zihinsel yetersizliği olan çocuklarda sıklıkla rastlanılan bir durumdur (9). Zihinsel yetersizliği olan çocuklarda uyku sorunları 6-12 yaş aralığında yaygın olarak görülmekte olup, çocuğun ve ailesinin günlük yaşam aktivitelerinde olumsuz etkiler oluşturmaktadır. Bu sorunlar, hem çocukları hem de bakımdan sorumlu bireylerin baş etmekte zorlandığı davranışların başında gelmektedir (10-14). Zihinsel engelli çocuklarda uyku sorunları, vücut fonksiyonlarının bozulmasına, kardiyovasküler hastalıklara, diyabet, obezite, anksiyete, depresyon, dikkat eksikliği, motivasyon düşüklüğü ve bilişsel bozukluklara da neden olmaktadır (15-17).

Uyku sadece zihinsel engelli çocuklar için değil anneleri için de önemli bir fizyolojik gereksinimdir. Zihinsel engelli çocukların uyku sorunu tüm aile üyelerini, özellikle bakımdan sorumlu olan annelerin uykusunu da olumsuz olarak etkilemektedir

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(18). Engelli çocuğun bakımının yıllar sürmesi, ailelerin özellikle annelerin bakımı için güç sarf etmeleri ve sık sık uykusuz kalmaları sürekli yorgun hissetmelerine, bel ve sırt ağrıları yaşamalarına yol açmaktadır (11).

Zihinsel Engelli Çocuklar ve Annelerinde Sık Görülen Uyku Sorunları

Uyku sorunları her dönemde ve her yaşta yaygın olarak görülen bir sorundur. Çocukların uyku alışkanlıklarını etkileyen ve çocuklarda uyku sorunlarına neden olan pek çok faktör bulunmaktadır. Yapılan araştırmalarla zihinsel engelli çocukların %25'inden fazlasının uyku sorunları yaşadığı belirlenmektedir (19). Zihinsel engelli çocukların yaklaşık 2/3'ünün kronik uykusuzluk sorunu yaşadıkları ve ailelerin yaşam kalitesini etkilediği sonucuna ulaşılmıştır (20). Yapılan bir çalışmada özellikle uykuya dalma ve uykuyu sürdürme sorunları, uykuya başlama süresinin uzun olduğu, geceleri uykudan sık uyandıkları, gündüz uykusuzluk ve kısa süreli uyku (şekerleme), tekrar uykuya dalmakta zorluk çektikleri, uykuya dalma güçlüğü %23, gece sık uyanmalar %28, uykuda konuşma %32, diş gıcırdatma %9,5 gibi sorunlar yaşadıkları belirlenmiştir (21-23).

Zihinsel engelli çocuklarla yapılan bir çalışmada 3 yaş grubu çocukların %14'ünde gece sık uyanma, %12'sinde uykuya dalmada güçlük, 8 yaş grubunda ise %12 uykuya dalmada güçlük, %3 oranında da gece sık uyanma gibi sorunların olduğu bildirilmiştir. Uyurgezerlik %17, uykuda konuşma %5, uykuda horlama %10-12, obstrüktif uyku apne sendromu %2, uykusuzluk %10-30 oranında bildirilmiştir (24). Uyku ile ilgili yapılan başka bir araştırma ise İzmir ilindeki bir Özel Eğitim İlköğretim Okulu'nda eğitim gören zihinsel yetersizliği olan 59 çocuk ile yürütülmüştür. Çocukların 25'i kız, 34'ü erkektir. Çocukların %39'u anneyle birlikte uykuya dalmakta, %76,3'ü uykuya dalarken herhangi bir obje gereksinimi duymakta, %39'u kendi odasında yalnız uyuyamamaktadır. Çalışma sonucuna göre, çocukların kaliteli uyku uyuyamadıkları, agresif, gündüz uyuklama gibi sorunlar yaşadıkları belirlenmiştir (25).

Hollanda'da yapılan bir çalışmada ise ileri düzeyde zihinsel yetersizliği olan, ilaç kullanan, epilepsi ve serebral palsili çocukların daha fazla uyku sorunları yaşadığı saptanmıştır (26). Genel olarak uykuya dalma, uykuyu sürdüme, hipotoni nedeniyle horlama, uyku apsesi, aşırı uykululuk hali, erken uyanma, diş gıcırtma gibi sorunlar da belirlenmiştir (27). Zihinsel engelli çocuklarda ilaç kullanımının da (diüretik, sedatif, antidepresan vb.), uyku düzeninde sorunlar oluşturduğu belirtilmiştir (28).

Zihinsel engelli çocukların annelerinde uykusuzluk, baş ağrısı, anksiyete, agresiflik, migren, depresyon, hipertansiyon, geceleri sık sık uyanma, uyanamama, gündüz uyuklama, gece uyku süresinin uzaması uykuya dalmada ya da devam ettirmede zorluk, aile de rollerin yerine getirilememesi, fiziksel, zihinsel işleyiş bozukluğu, iletişimin azalması, sosyal ve iş hayatında değişiklikler gibi çeşitli sorunlar görülmektedir (29).

Zihinsel Engelli Çocukların Uyku Sorunlarına Yönelik Çözüm Önerileri

Uyku problemleri için, düzenli uyku- uyanıklık durumlarının düzenlenmesi için programlar geliştirilip, davranışsal müdahele tedavileri, farmakolojik yöntemler bir sağlık personeli eşliğinde destek olunmalıdır (30,31). Çocukların uyku örüntülerini/ düzenlerini karşılaştıran araştırmalar planlanması önerilebilir. Sağlıklı uyku alışkanlıklarının geliştirilmesi için bebeklik döneminden başlayarak ailelere danışmanlık yapılması, uyku saati rutinlerinin oluşturulması, yatma zamanlarının düzenlenmesi, yatağa gitme zamanı yaklaştığında sessiz bir ortam oluşturulması, yatak odalarının rahat-sessiz-loş-uygun ısıda olmasına özen gösterilmesi gibi önlemler alınabilir (24).

Çocuğun hem kendi hem de ailesine ilişkin uyku özellikleri, günlük rutin alışkanlıkları, yatmanda önce yapılan rutinler, uyku çevresi, zamanlaması uyku kalitesini olumlu yönde etkilemektedir (32). Çocuk uyumadan önce, banyo yaptırılması, diş fırçalaması, masal okunması, sevdiği aktiviteleri yaptırılması uyku sorununun çözülmesine yardımcı olmaktadır (33). Zihinsel engelli çocuklara yönelik uygulanabilir kaliteli uyku öneri programı Şekil 1'de gösterilmiştir.

Şekil 1. Kaliteli uyku öneri programı (34)

Uyku çevresi düzenlemesi: Çocuğun yattığı odanın loş ışıklı ve sessiz bir ortamda bulunması, oda sıcaklığının uygun koşullarda olması, odanın içerisine herhangi bir hayvan bulunmaması, yatağın sadece uyumak için kullanılması, çocuğun uyku kalitesini azaltacak aktivitelerden uzak durulması önerilir (35).

Uyku zamanın düzenlenmesi: Her gün aynı zamanda uyuma ve yatma, haftalık uyku süresini düzenleme, gündüz uyumama, uykuya dalma süresi uzun sürüyorsa çocuğun uykusunu kolaylaştıran ve sevdiği aktiviteler yaptırılmalıdır (36).

Günlük aktivitelerin düzenlenmesi: Çocuğun çok yorucu aktivitelerden uzak tutulması, yaşına ve mental sağlığına uygun aktivitelerin yaptırılması önerilmektedir (37). Yapılan bir çalışmada günde 2 kere yapılan Tai-Chi egzersisinin uyku kalitesini olumlu yönde etkilediği ve uygulama ile yapılan masajın yararlı olduğu ve çocuk uyumadan önce süt ve süt ürünlerinin tüketilmesi uykuya geçişi kolaylaştırdığı belirlenmiştir (34,36).

Besin alımını düzenleme: Çocuğa yatmadan önce kafein içerikli gıdaların verilmemesi, yatmadan önce süt içme, eğer çocuk acıktı ise; büyük öğünler yerine, atıştırmalık yiyecekler verilmesi önerilir (38,39).

Zihinsel kontrole ilişkin düzenlemeler: Yatmadan önce zihinsel aktiviteyi teşvik edici etmenlerden kaçınılmalı, çocuğun seveceği müzik dinletilmesi, görsel imgeleme ve gevşeme egzersizleri yapılması önerilir (37).

Zihinsel Engelli Çocukları Olan Annelerin Uyku Sorunlarına Yönelik Çözüm Önerileri

Zihinsel engelli çocukların annelerin uyku sorunlarına yönelik olarak;

- Anneler çok stresli ortamlardan uzak durmalıdır.
- Uyuduğu ortamın uygun koşullarda olması gereklidir.
- Uyanır uyanmaz yataktan kalkılmalıdır.
- Aynı saatte uyumak ve aynı saatte kalkmak gerekir.
- Uyumadan önce alkol, kahve gibi kafein içeren sıvılardan uzak durulmalıdır.
- Gündüz uykularından uzak durulmalıdır.
- Mümkün olduğunca çocuğu ile aynı saatte uyumalı ve aynı saatte uyanmalıdır.
- Günlük rutinlerinin düzenli bir şekilde devam edilmesine özen gösterilmelidir.
- Uyumadan önce fazla aktivite içeren etkinliklerden uzak durulmalıdır.
- Uyumadan önce uykuyu kolaylaştıran uygulamalar (süt içilmesi, klasik müzik dinleme vb.) yapılmalıdır (40,41).

Tartışma

Zihinsel yetersizliği olan çocuklarda en sık karşılaşılan; gece uyanma, sabahları erken kalkma, ebeveyn ile birlikte yatma ve uyumaya direnç gösterme gibi uyku sorunları yaşadıkları belirlenmiştir (32). Uyku sorunlara yönelik, kaliteli uyku eğitim programı ile ilgili yapılan araştırmalar ve programının etkili olduğu sonucuna varılmıştır Austin ve ark. (42) tarafından yapılan bir çalışmada ise 3-7 yaş aralığında gelişimsel yetersizliği olan çocuğa sahip altı ebeveynin katılımı ile uyku eğitimi gerçekleştirmişlerdir. Araştırmada çocukların uykuya direnme ve gece uyanma davranışlarında azalma amaçlanmıştır. On beş hafta süre ile devam eden araştırmanın sonuçları, çocukların uyku sorunlarında azalma olduğunu göstermiştir (42). Benzer bir uyku eğitimi programının grup ya da bireysel olarak sunulması sonucundaki etkileri karşılaştırılmıştır. En geniş katılımcı grubuyla gerçekleştirilmiş olan bu çalışmaya, yaşları 2-10 arasında değişen ve otizm spektrum bozukluğu (OSB) tanısı almış çocuk sahibi 80 ebeveyn katılmıştır. Araştırmanın sonuçları uyku eğitimlerinin uyuma süreleri üzerine olumlu etkisi olduğu belirlenmiştir (43). Yapılan başka bir çalışmada ise toplam 40 OSB tanılı 3-5 yaş arası çocuk ve ebeveynleri uyku eğitim programına dahil edilmiştir. Çocukların ebeveynlerine sekiz haftalık olmak üzere beş oturumluk kaliteli uyku program bireysel olarak verilmiştir. Program sonucunda çocukların uyku sorunlarında azalmaları olduğu belirlenmiştir (44). Beş OSB ve 7 Fragile X sendromu olan çocuk sahibi 12 ebeveyn ile aile eğitimine (kardeş ve diğer üyeler) dayalı uyku eğitiminin etkililiğini incelemişlerdir. Uyku sorunları, davranışsal stratejileri, uyku zamanı rutinleri, sönme uygulamaları hakkında eğitim verilen çalışmada, katılımcılar arası çoklu başlama düzeyi modeli kullanılmıştır. Araştırmanın sonunda çocukların gece uyanma ve birlikte uyuma davranışlarında azalmalar olduğu belirtilmiştir (45). Başka bir çalışmada küçük grup düzenlemesi biçiminde sunulan uyku eğitimi programının etkililiği incelenmiştir. Gruplar 3-5 kişilik aile katılımlarıyla gerçekleştirilirken çalışmaya toplam 20 OSB çocuk sahibi aile katılmıştır. Çocukların yaşları 3-10 arasında değişmektedir. Araştırmanın sonuçları uyku eğitimi programının, çocukların hem uyku davranışları hem de gün içindeki davranışları ile ailelerin stres düzeyleri üzerinde olumlu etkileri olduğunu göstermektedir (46).

Sonuç

Uyku sorunları her yaşta ve her dönemde görülebilen bir durumdur. Özellikle zihinsel engelli çocuklarda, ve annelerinde kalıcı etkiler bırakan, çevresini de etkileyen bir durumdur. Zihinsel engelli çocuk ile annelerine uyku kalitelerini artırmaya yönelik kaliteli uyku öneri programlarının uygulanması ve annelere uyku hijyenine (fizyolojik, psikolojik ve çevresel faktörler) yönelik eğitimlerin verilmesi hem kendilerinin hem de çocuklarının uyku sorunların azaltılmasına yardımcı olacaktır.

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The Relationship Between GPX1 Pro198Leu Manganese Superoxide Dismutase Ala16Val Variants and Obstructive Sleep Apnea Syndrome

GPX1 Pro198Leu ve MnSOD Ala16Val Varyantları ile Obstrüktif Uyku Apnesi Sendromu Arasındaki İlişki

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Abstract

Objective: To investigate the association between obstructive sleep apnea syndrome (OSAS), glutathione peroxidase-1 (GPX1) *Pro198Leu*, and manganese superoxide dismutase (MnSOD) *Ala16Val* gene polymorphisms.

Materials and Methods: The study included 81 patients with OSAS and 75 healthy controls from the Turkish population. Genotypes of the MnSOD rs4880 T/C *(Ala16Val)* and GPX1 rs1050450 T/C *(Pro198Leu)* variants were determined via single-nucleotide polymorphisms genotyping analysis, which is based on simple probe melting curve analysis.

Results: The frequencies of the MnSOD rs4880 T/T, T/C, and C/C were 35.8%, 50.6%, and 13.5% in patients with OSAS and 34.6%, 49.3%, and 16% in the controls, respectively. No statistically significant difference was determined between patients and controls in terms of MnSOD rs4880 variant genotype and allele distribution (odds ratio: 1.07; 95% confidence interval: 0.68-1.69; p>0.05). The frequencies of the GPX1 rs1050450T/T, T/C, and C/C were 12.0%, 38.5%, and 49.4% in patients with OSAS and 13.1%, 42.1%, and 44.7% in the controls, respectively. No statistically significant difference was determined in the genotype and allele frequencies of the GPX1 rs1050450 variant between the patients and controls (p>0.05). Additionally, the haplotype was examined on the basis of combined genotypes for the two variants in patients with OSAS and controls, which revealed no statistically significant correlation.

Conclusion: Our study indicates that two polymorphisms in these antioxidant enzymes were not associated with Turkish patients with OSAS. Further studies may reveal an association between these two polymorphisms with some clinical parameters in patients with OSAS.

Keywords: Gene polymorphisms, GPX1, MnSOD, obstructive sleep apnea syndrome, oxidative stress

Öz

Amaç: Bu çalışmanın amacı obstrüktif uyku apne sendromu (OUAS) ve glutatyon peroksidaz-1 (GPX1) *Pro198Leu* ve manganez süperoksit dismutaz (MnSOD) *Ala16Val* gen polimorfizmleri arasındaki ilişkiyi araştırmaktır.

Gereç ve Yöntem: Çalışmaya OUAS'li 81 hasta ve 75 sağlıklı kontrol dahil edildi. MnSOD rs4880 T/C *(Ala16Val)* ve GPX1 rs1050450 T/C *(Pro198Leu)* varyantlarının genotipleri, SNP tipleme analizi ile belirlendi.

Bulgular: MnSOD rs4880T/T, T/C, C/C frekansları hastalarda sırasıyla %35,8, %50,6 ve %13,5 ve kontrollerde %34,6, %49,3 ve %16 idi. Hastalar ve kontroller arasında MnSOD rs4880 varyant genotipi ve alel dağılımı açısından istatistiksel anlamlı fark saptanmadı (olasılık oranı: 1,07; %95 güven aralığı: 0,68-1,69; p>0,05). GPX1 rs1050450T/T, T/C, C/C frekansları hastalarda sırasıyla %12,0, %38,5 ve %49,4 ve kontrollerde %13,1, %42,1 ve %44,7 idi. Hastalar ve kontrol grubu arasında GPX1 rs1050450 varyantının genotip ve alel frekanslarında anlamlı bir fark gözlenmedi (p>0,05). Ayrıca OSAS hastalarında ve kontrol grubunda, iki varyant için kombine genotiplere dayanan haplotipi arasında ilişki saptanmadı.

Sonuç: Çalışmamız, GPX1 *Pro198Leu*, MnSOD *Ala16Val* gen varyantlarının OUAS ile ilişkili olmadığını göstermektedir. İleri çalışmalar, bu iki polimorfizmin OUAS hastalarında bazı klinik parametrelerle ilişkili olduğunu ortaya çıkarabilir.

Anahtar Kelimeler: Gen polimorfizm, GPX1, MnSOD, obstrüktif uyku apne sendromu, oksidatif stres

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Introduction

Obstructive sleep apnea syndrome (OSAS) is characterized by complete or partial obstruction of the upper airway during sleep. Intermittent hypoxemia, transient hypercapnia, and frequent arousals occur in OSAS (1). OSAS is characterized by repetitive cycles of hypoxia and reoxygenation. In previous studies, it was shown that typical role of oxidative stress in patients with OSAS (2,3).

If oxidation is not eliminated by antioxidant enzymes in cells, oxidative stress occurs. In fact, there is a balance between oxidant and antioxidant reactions in the human body. Increased production of reactive oxygen species (ROS) or an organism's reduced ability to counteract ROS through antioxidant enzymes may lead to OS. ROS are highly aggressive and therefore, induce lipid peroxidation and DNA damage (4,5).

Although OS occurs in all individuals, some of them are more prone to damage caused by OS. Genetic factors such as polymorphisms in genes of antioxidant enzymes may affect the individual defense response against OS and subsequent pathology (6). Antioxidant enzymes provide cell defense against OS. Glutathione peroxidase-1 (GPX1) and manganese superoxide dismutase (MnSOD) are among these enzymes. The gene encoding MnSOD has five exons on chromosome 6q25 (7). A well-known polymorphism of MnSOD is the *Ala16Val* polymorphism, which is replacement of GCT with GTT. This polymorphism affects the conformation of the leader signal of MnSOD and diminishes the localization of MnSOD to mitochondria (8,9). GPX1 is the most abundant isoform of glutathione peroxidase and has a role in antioxidant activity of the cell (10,11). GPX1 eliminates peroxides by converting them into water and alcohol (12). One of the polymorphisms in the *GPx-1* gene is found at codon 198 (C to T); this leads to the replacement of proline (CCC) with leucine (CTC). The amino acid substitution affects the structural conformation of the active site region and leads a reduction in the enzyme activity (13). The Pro198Leu variant of this enzyme has been shown to cause a 40% reduction in the enzyme activity (14).

Since there is an association between OSAS and OS, we suggested that there may be an association between OSAS and the two polymorphisms in two antioxidant enzymes, namely the GPX1 *Pro198Leu* and MnSOD *Ala16Val* variants. These two polymorphisms may play a relevant role in the oxidative stress in OSAS patients.

Materials and Methods

Subjects

Eighty-one patients with OSAS were included in the study group (50 males and 31 females), and 75 (44 males and 31 females) healthy controls were enrolled. Subjects recruited for the study were over 18 years of age. Patients were excluded on the basis of having a genetic syndrome, mental retardation, and central sleep apnea syndrome. Subjects with systemic disease, chronic inflammatory or autoimmune disorders, and cancers were excluded from this study. Informed written consent was obtained from all subjects before enrollment to the study. The study was performed according to the Declaration of Helsinki, and was approved by the Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee (approval no: 201-15/177).

Polysomnography monitoring

To objectively determine the night sleeping status of each participant, polysomnography was carried out by the in-laboratory Philips Respironics Alice 5, 2016, USA device using the American Academy of Sleep Medicine 2007 criteria. The polysomnography scoring was calculated automatically by the computer software and controlled by the experienced pulmonologist in sleep medicine. The patient group was divided into mild-moderate OSAS and severe OSAS.

Genotype analysis

To determine genotypes of the MnSOD rs4880 T/C and GPX1 rs1050450 T/C (Pro198Leu) missense variants in OSAS cases and healthy controls, SNP typing analysis (LightSNIP; Tib-MolBiol, Berlin, Germany) were carried out. The analysis was attribute to simple probe melting curve analysis, which was utilized to detect GPX1 (rs1050450) and SOD2 (rs4880) polymorphisms. On the Roche Light Cycler 480 II platform, polymerase chain reaction (PCR) and melting curve analyses were conducted. The reaction for each SNP was performed in a final volume of 20 µL and included 2 µL DNA, 1 µL LightSNIP reagent mix (Tib-MolBiol), 2 µL LightCycler FastStart DNA Master HybProbe (Roche Diagnostics GmbH, Mannheim, Germany), 1.6 µL $MgCl_2$ (25 mM), and 14.4 µL H_2O. The PCR consisted of a denaturation step at 95 °C for 10 minutes at 45 cycles, a denaturation at 95 °C for 10 seconds, an annealing step at 60 °C for 10 seconds, and elongation at 72 °C for 15 seconds, respectively. After the last cycle, samples were held at 95 °C for 30 seconds before the temperature was lowered to 45 °C. Next, melting was conducted by steadily raising the temperature in 0.5 °C increments every 2 seconds from 45 °C to 75 °C.

Statistical Analysis

The statistical analyses were done by SPSS Statistical Program Version 21.0 and Openepi 3.01 software package programs. Continuous data were given as mean ± standard deviation and (minimum-maximum). A chi-square test was utilized to analyze the significance differences in the allele frequency and genotype distribution between the two study groups. A Hardy-Weinberg equilibrium test was done for both study groups.

Results

Demographic and clinical characteristics of the cases and control subjects in the studied population are shown in Table 1. In OSAS patients, the mean age was 52.20±11.17 years. In healthy controls, the mean age was 45.48±11.65. The male/female ratio was 61.72/38.27% in patients with OSAS and 58.66/41.33% in controls. Table 2 shows the MnSOD rs4880 T/C and GPX1 rs1050450 T/C (Pro198Leu) variants genotype and allele distribution. The frequencies of the MnSOD rs4880T/T, T/C, C/C were 35.8%, 50.6%, and

13.5% in patients and 34.6%, 49.3%, and 16% in controls, respectively. The frequency of the T allele in patient cases was 61.1% and 59.3% in the healthy control group. Statistically significant differences were not found between OSAS patients and healthy controls with respect to the MnSOD rs4880 variant genotype and allele distribution [odds ratio (OR): 1.07; 95% confidence interval (CI): 0.68-1.69; p>0.05] (Table 2). The frequencies of the GPX1 rs1050450T/T, T/C, C/C were 12.0%, 38.5%, and 49.4% in patients and 13.1%, 42.1%, and 44.7% in controls, respectively. The frequency of the T allele in patient cases was 31.3% and 34.2% in the healthy control group. We observed no significant differences in the genotype and allele frequencies of GPX1 rs1050450 variant between OSAS patients and controls (OR: 0.87; 95% CI: 0.54-1.40; p>0.05) (Table 2). We also examined the haplotype analysis based on the combined genotypes for the two variants in OSAS patients and healthy controls using the Haploview software (version 4.2) (Table 3). Compared to control group, there was no statistically significant difference between OSAS and the different haplotypes of MnSOD rs4880 T/C and GPX1 rs1050450 T/C.

Table 1. Baseline clinical and demographics features of the patients with OSAS

Characteristics	Control group	OSAS group
Gender, male/female (n)	44/31	50/31
Age, mean ± SD, years	45.48±11.65	52.20±11.17
BMI (kg/m^2), mean ± SD*	24.97±3.12	34.87±6.04
AHI (events/h), mean ± SD**	3±2	44±23
Mild-moderate sleep apnea Severe sleep apnea	- -	24 (38.7%) 38 (61.3%)

OSAS: Obstructive sleep apnea syndrome, n: Number of subjects, SD: Standard deviation, BMI: Body mass index, AHI: Apnea-hypopnea index, *p<0.05, **p<0.01

Discussion

Cycles of hypoxia and reoxygenation is one of the characteristics of OSAS, and these cycles of hypoxia lead to the production of ROS and OS. There are OS markers consistently associated with OSAS such as malondialdehyde and antioxidant enzyme superoxide dismutase (SOD) (15). Since antioxidant enzymes were found to be associated with OSAS, we intended to research the association of polymorphisms in two antioxidant enzymes, GPX1 and MnSOD, with OSAS. We studied the frequencies of GPX1 *Pro198Leu* (rs1050450 T/C variant) and MnSOD *Ala16Val* (rs4880 T/C variant) variants in 81 patients with OSAS and 75 healthy controls. We found that these antioxidant enzyme gene polymorphisms in OSAS patients were not statistically significant difference from healthy people.

In a study, serum markers for OS in OSAS patients were investigated, and patients with severe OSAS were shown to have significantly lower serum levels of two important antioxidant enzymes, catalase and GPx. Serum malondialdehyde levels were also higher in OSAS group (16). Repeated cycles of hypoxia in OSAS patients alter arterial oxygen saturation, and this situation may induce the production of ROS (17). The release of ROS in these patients may damage the vascular endothelium, which may be the underlying mechanism for cardiovascular morbidities in OSAS patients (18). Others have also reported the increase of OS markers in OSAS patients (19,20). Lavie et al. (20) reported that compared to controls, the levels of thiobarbituric reactive substances (TBARS) and peroxides (PD) were higher in OSAS patients. In addition, there was a negative correlation between the respiratory disturbance index (RDI) and the antioxidant protective enzyme paraxonase-1. Conversely, there was a positive correlation between concentrations of TBARS and PD and RDI in OSAS patients. Moreover, there was a tendency of decreased paraxonase-1 in OSA patients with cardiovascular disease. These results strongly suggest that OS and OS markers are increased in OSAS patients, and the degree

Table 2. Genotype and allele frequencies of *MnSOD* and *GPX1* gene polymorphisms in OSAS patient and control groups

Gene	OSAS group n=81	Control group n=75	p	OR (CI 95%)
MnSOD rs4880				
Genotypes				
T/T	29 (35.8%)	26 (34.6%)		
T/C	41 (50.6%)	37 (49.3%)	>0.05	
C/C	11 (13.5%)	12 (16%)		
Alleles				
T	99 (61.1%)	89 (59.3%)	>0.05	1.07 (0.68-1.69)
C	63 (38.8%)	61 (40.6%)		
GPX1 rs1050450				
Genotypes				
T/T	10 (12%)	10 (13.1%)		
T/C	32 (38.5%)	32 (42.1%)	>0.05	
C/C	41 (49.4%)	34 (44.7%)		
Alleles				
T	52 (31.3%)	52 (34.2%)	>0.05	0.87 (0.54-1.40)
C	114 (68.6%)	100 (65.8%)		

GPX1: Glutathione peroxidase-1, MnSOD: Manganese superoxide dismutase, OR: Odds ratio, CI: Confidence interval

Table 3. Comparative analysis of combined genotypes of patients and controls					
Genotypes	**Patients (n=81)**		**Control (n=75)**		**p**
	n	**%**	**n**	**%**	
SOD2 rs4880 T/C-GPX1 rs1050450 T/C					
TT-TT	3	3.7	5	6.6	>0.05
TT-TC	11	13.5	12	16	
TT-CC	15	18.5	9	12	
TC-TT	4	4.9	3	4	
TC-TC	17	20.9	15	20	
TC-CC	20	24.6	19	25.3	
CC-TT	3	3.7	2	2.6	
CC-TC	4	4.9	4	5.3	
CC-CC	4	4.9	6	8	
GPX1: Glutathione peroxidase-1					

of OS in OSAS patients correlate with comorbidities observed in these patients. Sales et al. (21) showed that antioxidant levels were lower in patients with OSAS. The patients had decreased amounts of vitamin E, superoxide dismutase, and vitamin B11. They found that these values might correlate with impaired cognitive function in these patients.

Several SNPs were associated with OSAS. The C haplotype of rs5417 in *glucose transporter 4* gene was shown to be associated with OSAS in Chinese population (22). The frequencies of minor alleles of the IL-10 gene promoter polymorphisms were higher in Turkish population with OSAS, and ATA haplotype of three polymorphisms in IL-10 gene promoter was significantly higher in OSAS patients (23). Bhushan et al. (24) compared two obese groups with or without OSAS (n=207 individuals) and showed that the A allele of TNF-alpha gene promoter polymorphism (-308G/A) was higher in obese individuals with OSAS compared to obese individuals without OSAS (28.8% vs. 12.6%). Furthermore, serum TNF-alpha values were higher in patients with OSAS (24). Based on this study, SNPs in the gene regions of inflammatory players such as IL-10 and TNF-alpha are associated with OSAS. At the same time, it was shown that OS stress causes the activation of inflammatory cascade in patients with OSAS. This might be associated with comorbidities such as cardiovascular diseases observed in patients with OSAS (25,26). Therefore, SNPs in antioxidant enzyme genes might be associated with OSAS as SNPs in inflammatory genes were associated with OS and inflammation in patients with OSAS. This concept was one of the reasons that made us to hypothesize that there might be *SNPs* in *GPx1* and *MnSOD* genes associated with OSAS.

Since there is an association between OSAS and OS, it was expected that there were polymorphisms of oxidant and antioxidant enzyme genes linked to OSAS. There are reports indicating an association between these types of enzymes and OSAS. OS may be caused by over-generation of ROS. The major source of ROS in the vasculature are the NADPH oxidases (27). The G allele of A-930G polymorphism in the gene region of the p22phox subunit of NADPH oxidases was found to be associated with OSAS (28). The paraoxonase-1 (*PON-1*) gene L55M polymorphism and enzyme activity were investigated in patients with OSAS and controls. *PON1* gene L55M polymorphism frequency was significantly different between patients with OSA and controls, and the paraoxonase activity of the enzyme was lower in patients (29,30).

GPX1 and MnSOD are critical antioxidant enzymes in the control of ROS. Genetic variants of these enzymes especially GPX1 *Pro198Leu* and MnSOD *Ala16Val* have been implicated in various diseases. It was found that the Val/Val genotype (T/T) of MnSOD was higher in men in patients with coronary heart disease (CHD) compared to controls (39.18% vs. 22.69%). Males with this genotype were almost at two-fold risk of CHD. However, in this study, there was no association between Pro198Leu GPx polymorphism to CHD risk (31). Ischemic stroke (IS) risk was shown to be nearly four-fold higher in patients carrying the *Val* allele of MnSOD compared to ones with the *Ala* allele. On the other hand, GPX1 Pro193Leu was not found to be a risk factor for IS (32). Studies imply that GPX1 and MnSOD could have a protective role against atherosclerosis (33,34). In another study, there was an association between vascular complications of diabetes mellitus and MnSOD *Ala16Val* polymorphism (35). Kangas-Kontio et al. (36) showed that the MnSOD *Ala16Val* polymorphism is associated with diabetic retinopathy (36). The GPx1 Pro198Leu polymorphism has been found to be associated with bladder cancer. Coexistence of MnSOD Ala/Ala genotype with GPX1 Leu/Leu genotype had a synergistic effect on risk of disease (37). In several studies GPx1 Pro198Leu polymorphism was shown to be linked breast and lung cancer, coronary heart disease, and diabetic peripheral neuropathy (38-41). There are several limitations of our study. Our study sample is relatively small. In addition, inclusion and analysis of a higher number clinical parameters and serum parameters would make it possible to correlate studied SNPs, and those clinical parameters.

Conclusion

We suggested that there might be a link between polymorphisms of two antioxidant genes, GPx1 and MnSOD, since OS was strongly implicated in patients with OSAS. However, we found

that these two antioxidant enzyme gene polymorphisms were not statistically significant compared to healthy individuals without OSAS. Further studies may be performed in order to find out whether these two polymorphisms have an association with some clinical parameters or serum markers in OSAS patients.

Ethics

Ethics Committee Approval: The study was performed according to the Declaration of Helsinki, and was approved by the Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee (approval no: 201-15/177).
Informed Consent: Informed written consent was obtained from all subjects before enrollment to the study.
Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: H.S., H.İ.K., E.E.T., Design: D.Z., Data Collection or Processing: H.S., H.İ.K., D.Z., A.E., A.T., Analysis or Interpretation: H.S., H.İ.K., D.Z., A.E., A.T., E.E.T., Writing: H.S., H.İ.K., D.Z., E.E.T.
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Sleepiness, Insomnia, and Sleep Quality of Hospitalized Patients with Coronavirus Disease-2019: Sleep Scale Evaluation

Hastanede Yatarak Tedavi Alan Koronavirüs Hastalığı-2019 Hastalarında Uykululuk, Uykusuzluk ve Uyku Kalitesinin Uyku Ölçekleri ile Değerlendirilmesi

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Abstract

Objective: Sleep disorders are common and may cause accidents and inefficiencies in daily life as well as increase the risk of infection and deteriorate prognosis. This study aimed to evaluate sleepiness, insomnia, and quality of sleep with sleep scales in patients with suspected and confirmed Coronavirus disease-2019 (COVID-19) who were hospitalized for treatment.

Materials and Methods: The study was conducted in University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital between May and June 2020. Group 1 comprised 49 patients with a confirmed COVID-19 diagnosis on thoracic computed tomography (CT) and polymerase chain reaction test. Group 2 comprised 45 patients with a suspected diagnosis of COVID-19 on thoracic CT. The required data were collected using the Epworth sleepiness scale (ESS), insomnia severity index, and Pittsburgh sleep quality index.

Results: No significant difference was found between the confirmed and suspected disease groups, which were divided into 4 subgroups according to insomnia severity and into 2 groups according to the ESS findings. A statistically significant difference was detected between these groups concerning sleep quality (p=0.02).

Conclusion: As a biopsychosocial entity, a person may be easily affected by COVID-19; hence, the consequent psychosomatic aspects of this pandemic should not be neglected and the sleep quality of patients should be thoroughly investigated.

Keywords: COVID-19, sleep quality, sleepiness, insomnia

Öz

Amaç: Uyku bozuklukları, toplumda sık görülen ve insan yaşamında kazalara, verimsizliğe ve enfeksiyon riskinin artmasına ve prognozun kötüleşmesine yol açabilen hastalık grubudur. Bu çalışmanın amacı olası ve kesin tanı alan ve hastanede yatarak tedavi alan Koronavirüs hastalığı-2019 (COVID-19) hastalarında uykuyu değerlendiren ölçekler ile uykululuk, uykusuzluk ve uyku kalitesi değerlendirilmesini yapmaktır.

Gereç ve Yöntem: Bu çalışmada Mayıs-Haziran 2020'de Sağlık Bilimleri Üniversitesi, Bursa Yüksek İhtisas Eğitim Araştırma Hastanesi'ne başvurup muayene bulguları, toraks bilgisayarlı tomografi (BT) ve polimeraz zincir reaksiyonu ile kesin COVID-19 tanısı almış 49 hasta (grup 1) ve muayene ve toraks BT'de COVID-19 ile uyumlu bulguları olan olası COVID-19 tanısı almış 45 hastaya (grup 2) Epworth uykululuk ölçeği (EUÖ), uykusuzluk şiddet indeksi (UŞİ) ve Pittsburgh uyku kalitesi indeksi (PUKİ) uygulandı.

Bulgular: UŞİ'ye göre dört alt gruba ayrılan olası ve kesin COVID-19 grubu arasında uykusuzluk şiddeti açısından istatistiksel anlamlı fark yoktu. Olası ve kesin COVID-19 grubunda EUÖ puanlarına göre istatistiksel anlamlı fark saptanmadı. Olası ve kesin COVID-19 grubunda iyi ve kötü uyku kalitesine göre istatistiksel anlamlı fark saptandı (p=0,02).

Sonuç: Biyopsikososyal bir bütün olan insanı her yönü ile etkileyen COVID-19 pandemisinin psikosomatik yönü göz ardı edilmeyip bireylerin uykuları ayrıntılı bir şekilde sorgulanmalıdır.

Anahtar Kelimeler: COVID-19, uyku kalitesi, uykululuk, uykusuzluk

Introduction

Sleep disorders are common diseases that may lead to accidents and inefficiency in daily life, and present an increased risk of infection and deteriorating prognosis. According to the American Academy of Sleep Medicine, sleep disorders can be examined in 8 categories which involve 85 sleep disorders. Insomnia is the most common sleep disorder, in which the individual has difficulty in falling asleep, maintaining the sleep and waking. Given the function and system of sleeping,

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insomnia can be described as conditions in which individuals cannot rest and consequently do not feel ready for a new day as they have not had sufficient sleep. According to a study of a healthy population in Turkey, insomnia was determined at the rate of 15.7% as non-relaxing sleep complaints, and at 4.9% for severe primary insomnia (1).

Another sleep disorder is hypersomnia, which is defined as unintentional sleeping and having difficulty staying awake in normal conditions during the daytime (2). Sleepiness refers to the tendency to fall asleep and may be of varying severity. In light sleep, hypersomnia is defined as unintentional sleeping in passive conditions such as resting with no attention needed. In middle sleep, it is defined as unintentional sleep, which occurs during activities that require attention such as driving cars or watching movies. Excessive sleepiness occurs unintentionally during activities such as eating or talking.

Sleep quality is the condition of feeling fresh, vigorous and ready for a new day. Sleep quality not only involves the quantitative aspects such as sleep latency (K2) (the time taken to fall asleep), duration of sleep, and the number of times the person wakes throughout the night, but also includes subjective aspects such as the depth and relaxation of sleep. Previous studies have shown that 30-40% of adults have sleep disorders while 15-35% have disorders that concern sleep quality (3-5).

Sleep is not only a condition of immobility that allows the body to rest, but also a process of active regeneration that prepares the body for life over again (6).

Sleep has significant effects on the immune system. Cells of the immune system have the ability to reproduce, regenerate and recover. Therefore, it is highly important to evaluate the sleep of patients with a suspected or confirmed Coronavirus disease-2019 (COVID-19) diagnosis as sleep disorders may lead to disease progression by weakening the immune system. During the pandemic, many people may experience difficulties in concentration and sleep as a result of fear and anxiety about their own or their loved ones' health because of possible exposure to COVID-19 infection, and changes in sleeping or eating habits.

The aim of this study was to evaluate sleepiness, insomnia, and sleep quality with sleep assessment scales applied to suspected and confirmed COVID-19 patients hospitalized for treatment.

Materials and Methods

The study data were collected in University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital between May and June 2020. Group 1 comprised 49 patients with a COVID-19 diagnosis confirmed on thorax computed tomography (CT) and polymerase chain reaction test. Group 2 comprised 45 patients with a diagnosis of suspected COVID-19 on thorax CT.

Each patient was interviewed in detail to obtain demographic data and medical history. Patients were excluded from the study if they had a previous diagnosis of sleep disorder (insomnia, hypersomnia, obstructive sleep apnea etc.), for which they were taking drugs, had a psychopathology treated with drugs, were aged 18 years, had an advanced general condition disorder, or did not fully complete the questionnaires. It was planned to include 100 patients in the study.

The Pittsburgh sleep quality index (PSQI) is a reliable and consistent questionnaire, which is widely used to determine sleep quality in many disease groups. Validity and reliability studies of the index for use in a Turkish population were conducted by Ağargün et al. (7).

The PSQI consists of 24 items, 19 of which are completed by the patient, and 5 by a partner or roommate. In 18 of the scale items there are 7 components of subjective sleep quality (K1), K2, sleep time (K3), accustomed sleep event (K4), sleep disorder (K5), use of sleep medication (K6) and daytime dysfunction (K7). Each component is scored between 0-3, with the total points of the 7 components providing the total scale points ranging from 0 to 21. A total score >5 points is evaluated as "bad sleep quality" (7).

The Epworth sleepiness scale (ESS) is a simple self-report scale, which questions the overall sleepiness level. It aims to assess the likelihood of sleeping or taking a nap in 8 different life situations (while sitting and reading a book, watching TV, sitting peacefully in a public place, travelling by car, having afternoon rest, talking with someone, sitting quietly without alcohol after lunch, stopping in a car in traffic for a few minutes). Total points >10 suggest a daytime sleep disorder. This is a simple, easy to understand scale for the assessment of, overall sleepiness level in adults with proven validity and reliability (8).

Insomnia was evaluated using the insomnia severity index (ISI), which was developed by Bastien et al. (9) in 2001 to assess the severity of insomnia. The validity and reliability of the ISI for a Turkish population was proven by Boysan et al. (10) in 2010. The total points are evaluated as 0-7: Clinically insignificant, 8-14: The threshold for insomnia, 15-21: Clinical insomnia (moderate level) and 22-28: Severe clinical insomnia.

The data collection form was implemented by the researchers through detailed interviews to obtain demographic data of age, gender, and marital status.

Informed consent was obtained from all the study subjects. Approval for the study was granted by the Ethics Committee of University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital (decision no: 2011-KAEK-25 2020/05-12). All study procedures were applied in compliance with the Helsinki Declaration.

Statistical Analysis

Data obtained in the study were analyzed statistically using IBM SPSS for Windows version 22 software (SPSS Inc., Chicago, IL, USA). Conformity of the data to normal distribution was assessed using the Kolmogorov-Smirnov test. Normally distributed continuous data were shown as mean ± standard deviation values, and data not showing normal distribution were stated as median (interquartile range) values. Continuous variables with normal distribution were compared using the independent samples t-test, and if distribution was skewed the Mann-Whitney U test was applied. Categorical data were compared using the chi-square test. A value of $p<0.05$ was considered statistically significant.

Results

Evaluation was made of 94 patients who completed the PSQI, ESS and ISI. Group 1 of 49 confirmed COVID-19 patients comprised 27 males and 22 females with a mean age of 46±18 years. Group 2 included 45 patients with a diagnosis of suspected COVID-19, comprising 15 males and 30 females with a mean age of 56±20 years (Table 1).

The two groups of confirmed and suspected COVID-19 patients were separated into 4 sub-groups according to the ISI score. A total score of 0-7 was evaluated as insignificant, 8-14 as threshold, 15-21 as moderate, and 22-28 as severe insomnia. No significant difference was determined between the 4 sub-groups of the confirmed and suspected COVID-19 groups in respect of insomnia severity. In both groups, the number of patients with insignificant insomnia was much greater than those with threshold, moderate and severe insomnia (Table 2).

The patients were separated into two sub-groups according to the ESS scores. Insomnia was evaluated as present with a total score of >10, and absent with a score of <10. No significant difference was determined between the confirmed and suspected COVID-19 patients in respect of the ESS scores. In both groups there was a higher rate of patients with higher sleepiness scores (Table 2).

Two sub-groups were formed according to the PSQI results evaluating sleep quality. Scores >5 indicated ''bad'' sleep quality, and scores of ≤5 were evaluated as ''good'' sleep quality. There was determined to be a statistically significant difference between the confirmed and suspected COVID-19 patient groups in respect of good or bad sleep quality (p=0.02) (Table 2). Bad sleep quality was determined at the rate of 55.1% in the confirmed COVID-19 group, and at 31.1% in the suspected COVID-19 group.

A statistically significant difference was determined between the confirmed and suspected COVID-19 patients in respect of total PSQI scores (p=0.02). In the examination of the component scores of K1, K2, K3, K4, K5, K6, and K7, no statistically significant difference was determined between the groups (Table 3).

No significant difference was found between the confirmed and suspected COVID-19 groups in respect of the overall ESS and ISI scores (p=0.75, p=0.95) (Table 3).

Table 1. The demographic data of patients with a diagnosis of confirmed or suspected COVID-19

	Suspected COVID-19	Confirmed COVID-19	p
Male n (%)	15 (33%)	27 (55%)	0.04
Female n (%)	30 (67%)	22 (45%)	0.04
Single n (%)	12 (27%)	5 (10%)	>0.05
Married n (%)	33 (73%)	44 (90%)	>0.05
Age (years) mean ± SD	56±20	46±18	>0.05

COVID-19: Coronavirus disease-2019, SD: Standard deviation

Discussion

Sleepiness, insomnia and sleep quality in patients with a diagnosis of confirmed or suspected COVID-19 were evaluated in this study using the ESS, ISI, and PSQI. Although there have been many studies investigating COVID-19 cases, very few have investigated the effect on sleep.

It was expected that a more severe level of sleep disorder according to the scales applied would be observed in the patients with confirmed COVID-19 than in the patient group with a suspected diagnosis of COVID-19.

A previous study by Huang and Zhao (11) reported that during the COVID-19 pandemic, one in three participants had symptoms of anxiety while one in five had depression and sleep disorders.

Although sleep disorders must be investigated under a broad spectrum, it is safe to say that the sleep disorder most expected to develop during an epidemic is insomnia. The implementation of quarantine to prevent the spread of infection the stigmatization of admission to hospital, and depression and anxiety may cause insomnia related problems (12).

In contrast to expectations, the current study results showed an insignificant level of insomnia according to the ISI. This finding may have resulted from the application of the scale to both patient groups in the early stages of the disease. Another reason for the insignificant level of insomnia may have been that the patients were informed about their disease in detail while they were in the hospital, together with the fact that they

Table 2. The insomnia severity scale, the Epworth sleepiness index and the Pittsburgh sleep quality index results of the patients with a diagnosis of confirmed or suspected COVID-19

		Suspected COVID-19	Confirmed COVID-19	p
The insomnia severity index	Insignificant (0-7)	25 (55.6%)	24 (49%)	p=0.36
	Threshold (8-14)	11 (24.4%)	17 (34.7%)	
	Moderate (15-22)	7 (15.6%)	8 (16.3%)	
	Severe (23-28)	2 (4.4%)	0 (0%)	
The Epworth sleepiness scale	Present	7 (15.6%)	8 (16.3%)	p=0.9
	Absent	38 (84.4%)	41 (83.7%)	
The Pittsburgh sleep quality index	Good	31 (68.9%)	22 (44.9%)	p=0.02
	Bad	14 (31.1%)	27 (55.1%)	

Present: ESS score >10, Absent: ESS score <10, Good: PSQI score <5, Bad: PSQI score >5, COVID-19: Coronavirus disease-2019, ESS: Epworth sleepiness scale, PSQI: Pittsburgh sleep quality index

Table 3. Comparison of the insomnia severity index, Epworth sleepiness scale and Pittsburgh sleep quality index mean scores of the patients with a diagnosis of confirmed or suspected COVID-19

	Suspected COVID-19	Confirmed COVID-19	p
ISI	7.9±6.5	7.8±5.9	0.95
ESS	4.9±4.9	5.2±4.9	0.75
PSQI-TOTAL	5.13±3.59	6.06±3.6	0.02
PSQI-K1	0 (0-1)	1 (0-2)	0.20
PSQI-K2	1 (0-1.5)	1 (0-2)	0.41
PSQI-K3	0 (0-0)	0 (0-0.5)	0.15
PSQI-K4	0 (0-0)	0 (0-0)	0.55
PSQI-K5	1 (1-1.5)	1 (1-2)	0.57
PSQI-K6	0 (0-0.5)	0 (0-0)	0.68
PSQI-K7	1 (1-2)	1 (1-2)	0.19

The median of PSQI K1-K2-K3-K4-K5-K6-K7 scores was identified as (25-75%), COVID-19: Coronavirus disease-2019, ESS: Epworth sleepiness scale, PSQI: Pittsburgh sleep quality index, K1: Sleep quality: K2: Sleep latency, K3: Sleep time, K4: Accustomed sleep event, K5: Sleep disorder, K6: Use of sleep medication, K7: Daytime dysfunction

were currently being treated and trusted the healthcare system and the staff.

Another study conducted during the COVID-19 pandemic detected insomnia in 26.2% of 2065 participants (13). In a different study, a clear increase was reported in the number of patients who described insomnia symptoms, and the severity was increased in patients with a history of insomnia.

A survey based study of 14505 participants reported that 76.7% of infected patients or infection suspected patients who were in medical isolation, 51% of patients who were in self-isolation with no human contact, and 42.3% of patients who were not isolated, were identified as having sleep problems, which peaked and then started to decrease at two weeks after the isolation (14).

Similar to other pandemics, COVID-19 is apparently also causing sleep-related diseases by affecting sleep time and quality, creating difficulties in sleeping, and causing insomnia and circadian rhythm sleep disorders. Moreover, existing sleep disorders can be exacerbated.

Mirroring previous studies in literature, the results of the present study revealed that sleep quality is affected badly. The fact that the sleep quality is bad in more than 30% of the cases in both groups was a valuable discovery. Considering that there was no significant difference between the two groups in terms of insomnia and sleepiness, that there was a difference in sleep quality implies that there is the possibility of sleep disorders developing in the long term.

Moreover, the components of sleep quality; K1, K2, K3, K4, K5, K6 and K7 were checked in sequence but no significant difference was found in either group.

Excessive daytime sleepiness (EDS) might be caused by sleep deprivation, obstructive sleep apnea, drug effects, substance use, or other medical and psychiatric causes, and rare cases of primary hypersomnia (e.g. narcolepsy, idiopathic hypersomnia) might be revealed as secondary (AASM 2014) (15). The rate of EDS cases in the current study was 15-16%. Fewer cases of EDS in patients admitted to hospital is an expected finding as there are almost no conditions in the hospital environment to cause such a disorder.

It should be remembered that sleep has crucial effects on the immune system, therefore in addition to other physical complaints, patients must be questioned in detail in respect of their sleep. Cells of the immune system have the ability to reproduce, regenerate and recover during sleep. The time of day when these cells regenerate in the best way is during nocturnal sleep. A decrease in sleep time and quality has a negative effect on the immune system and this increases the risk of infection, so an effective and ample amount of sleep can improve resistance to viral infections (14). With enough sleep, the body can have the strength to protect itself from many micro-organisms, including the coronavirus.

A deterioration in sleep quality during the pandemic will make healthy individuals more vulnerable to infection and create more difficulties.

Study Limitations

It was planned to only apply sleep scales to the patients in this study. As the hospital sleep laboratory was temporarily closed because of the COVID-19 pandemic, it was planned to apply tests to patients requiring polysomnography after this period.

A further limitation of the study was that the duration of symptoms and the duration of follow-up in hospital were not included in the evaluations.

Conclusion

In conclusion, the COVID-19 pandemic has resulted in detrimental effects in social, psychological, and economic aspects. As a biopsychosocial entity, a person can easily be affected by COVID-19 in every aspect and therefore the psychosomatic aspect of this epidemic should not be overlooked and patients must be evaluated in detail in respect of sleep.

Ethics

Ethics Committee Approval: Approval for the study was granted by the Ethics Committee of University of Health Sciences Turkey, Bursa Yüksek İhtisas Training and Research Hospital (decision no: 2011-KAEK-25 2020/05-12). All study procedures were applied in compliance with the Helsinki Declaration.

Informed Consent: Informed consent was obtained from all the study subjects.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: A.G., B.Ş., Design: A.G., Data Collection or Processing: A.G., B.Ş., Analysis or Interpretation: A.G., B.Ş., Literature Search: A.G., B.Ş., Writing: A.G.

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Factors Affecting Device Adherence of Patients with Obstructive Sleep Apnea Syndrome in the COVID-19 Pandemic and Normalization Process

COVID-19 Pandemi ve Normalizasyon Sürecinde Obstrüktif Uyku Apne Sendromlu Hastaların Cihaz Uyumunu Etkileyen Faktörler

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Abstract

Objective: Obstructive sleep apnea syndrome (OSAS) is a common sleep-related breathing disorder. Continuous positive airway pressure (CPAP) therapy is the most effective OSAS treatment; however, adherence to CPAP therapy is problematic with psychological symptoms and other sleep disorders. We investigated whether a difference existed between device compatibility of patients with OSAS who applied to the sleep outpatient clinic during the Coronavirus disease-2019 (COVID-19) pandemic and normalization process and those who applied during pre-epidemic period.

Materials and Methods: This study was a retrospective study. Patients with OSAS who applied to the sleep disorders center for device control between March 27, 2020 and July 1, 2020 and who used a device for at least one year were included. CPAP adherence time during this period and the same period in 2019 were compared.

Results: This study included 190 patients. Regarding the usage times of the device, the average usage time before the pandemic was 5.3±0.6 hours, whereas after the pandemic, it was 4.5±0.9 hours. The device usage time of 54 patients was over four hours before the pandemic; however, it decreased to under four hours after the pandemic. Regarding insomnia, anxiety, and circadian rhythm disorder, there was a significant difference between patients with adequate device use times and patients with inadequate device use times.

Conclusion: During the COVID-19 pandemic period, additional sleep disorders, such as insomnia, circadian rhythm disorder, nightmare disorder, and psychological problems, like anxiety symptoms, were expeienced by patients with OSAS. These added sleep and psychological problems affected the device compatibility of patients with OSAS. Knowing the problems that may arise during the COVID-19 pandemic process and conducting studies on these issues will help patients with OSAS, a risky group, improve device compliance.

Keywords: COVID-19, CPAP adherence, obstructive sleep apnea, pandemic

Öz

Amaç: Obstrüktif uyku apne sendromu (OUAS), yaygın görülen uyku ile ilişkili bir solunum bozukluğudur. Sürekli pozitif hava yolu basıncı (CPAP) tedavisi, OUAS'nin en etkili tedavisi olmakla birlikte, psikolojik semptomlar ve diğer uyku bozuklukları varlığında CPAP tedavisine uyumda güçlükler yaşanabilmektedir. Biz de çalışmamızda, Koronavirüs hastalığı-2019 (COVID-19) pandemisi ve normalleşme sürecinde OUAS hastalarının cihaz uyumluluğunda salgın öncesi döneme göre farklılık olup olmadığını araştırmayı amaçladık.

Gereç ve Yöntem: Araştırmamız retrospektif olgu-kontrol çalışması olup çalışmaya 27.03.2020-01.07.2020 tarihleri arasında uyku polikliniğine cihaz kontrolü için başvuran ve en az 1 aylık cihaz kullanım süresi olan 190 OUAS hastası dahil edilmiştir. COVID-19 pandemi-normalleşme süreci ile pandemi öncesindeki ortalama CPAP kullanım süreleri karşılaştırılmıştır.

Bulgular: Cihaz kullanım sürelerine bakıldığında pandemi öncesi ortalama kullanım süresi 5,3±0,6 saat iken pandemi sonrası ortalama cihaz kullanım süresi 4,5±0,9 saatti. Elli dört hastanın cihaz kullanım süresi pandemi öncesi 4 saatin üzerindeyken, pandemi sonrası 4 saatin altına düşmüştü. Yeterli cihaz kullanım süresi olan hastalarla yetersiz cihaz kullanım süresi olan hastalar karşılaştırıldığında, aralarında insomni, anksiyete ve sirkadyen ritim bozukluğu açısından anlamlı fark olduğu görüldü.

Sonuç: OUAS hastalarına COVID-19 pandemi döneminde insomni, sirkadyen ritim bozukluğu, kabus bozukluğu gibi uyku bozuklukları eklenmiştir. Eklenen bu uyku bozukluklarının, OUAS hastalarının cihaz uyumunu etkilediği gözlenmiştir.

Anahtar Kelimeler: COVID-19, CPAP uyumu, obstrüktif uyku apne, pandemi

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Introduction

Coronavirus disease-2019 (COVID-19) pandemic is a virus outbreak that occurred on December 1, 2019, in China. The transmission rate of the virus increased in mid-January 2020 and spread to the whole world. Pandemic affects both physical health and human psychology, also it affects the mental health and wellbeing of the uninfected community (1,2). Studies previously conducted during severe acute respiratory syndrome (SARS) infection have shown that stress, anxiety, and depressive complaints increased in the general population during the infection process (3). During the SARS-CoV-19 pandemic, it has been shown that daytime functionality and nighttime sleep are affected due to medical or social isolation, adding working remotely at home, distance education at home, decreased social communication, and health-related concerns (4). This situation causes psychiatric illnesses and sleep disorders or the advance of previous disorders.

Obstructive sleep apnea syndrome (OSAS) is the most common sleep-related breathing disorder. This disease is often accompanied by hypertension, diabetes, cardiovascular disease, and obesity. Obstructive apneic events; oxidative stress triggers sympathetic activation and inflammation, leading to the onset and progression of cardiac, vascular, metabolic, and cerebrovascular diseases (5,6). Intermittent hypoxia increases hypoxemic stress and causes reactive oxygen molecules to be released (7). In studies conducted with patients with OSAS, pro-inflammatory cytokines such as TNF-alpha and interleukin (IL)-6, IL-8, high levels of nuclear factor kappa B showed that inflammation plays a role in OSAS (8).

The most effective treatment of OSAS is continuous positive airway pressure (CPAP) therapy. With CPAP treatment, symptoms such as snoring, excessive sleepiness, morning headache, concentration and attention deficit, memory problems, and mood changes improve. There is a decrease in insulin resistance, stroke, hypertension, and cardiovascular disease risks (9). Also, it provides a decrease in traffic accidents and an increase in work efficiency (9). As the rate of CPAP usage, which has such significant effects, increases, its effectiveness increases; it is intended to use more than 4 hours a night (10,11). However, less than half of those use CPAP within the recommended period (12). Compliance with device therapy can be problematic, especially in some groups. It was observed that CPAP compliance decreased in the presence of an additional psychiatric disorder or other sleep disorder (13). Studies in patients with post-traumatic stress disorder (PTSD) have shown the relationship between anxiety and depression and low device compliance (14,15). Insomnia, sleep divisions, and recurrent arousals can affect CPAP compliance (16). Poor sleep quality, nightmares, mask-related problems, claustrophobia are other factors associated with low CPAP compliance. Therefore, psychiatric disorders and sleep disorders arising in the COVID-19 pandemic process are thought to affect CPAP compliance. Stopping PAP titration device usage during a pandemic may cause both psychological and physical changes during social isolation. However, it is very important to continue to use PAP titration effectively, especially in people with an increased workload, who continue driving a car and working with the device during a pandemic (17).

In our study, we aimed to investigate whether there is a difference in device compatibility of the OSAS patients who applied to the sleep outpatient clinic during the COVID-19 pandemic and normalization process compared to the pre-epidemic period.

Materials and Methods

This retrospective study was performed at the Sleep Disorders Center of the University of Health Sciences Turkey, Erenköy Mental and Neurological Diseases Training and Research Hospital. All study procedures were approved by the Local Ethics Committee and are compliant with the Declaration of Helsinki (no: 25, date: 06.07.2020). Because the study was retrospective, informed consent was not obtained from patients, but patient identification information was hidden.

In sleep disorders outpatient clinic, all of the admitted patients with the complaints of sleep-related breathing problems fill out Berlin questionnaire (18), the patient health questionnaire-9 (PHQ-9), the general anxiety disorder-7, and PHQ-15 scale (19). These scales are well- established instruments for screening for symptoms of depression, generalized anxiety, and somatization respectively, scores of which 5-9: Mild, 10-14: Moderate, ≥15: Severe anxiety symptoms. In our study, we accepted a score of five and above as the presence of related symptoms. If OSAS is suspected according to answers of Berlin questionnaire, the patients have a full night polysomnography (PSG). The patient who has >5 apnea-hypopnea index (AHI) is diagnosed with OSAS. When AHI >15 or AHI between 5-15 with high Epworth score or additional systemic disease like hypertension, diabetes mellitus etc. or a history of stroke, the patient has a second full night PSG with positive airway pressure (PAP) titration device to determine the appropriate device and pressure. Then the patients are followed at our outpatient clinic for clinical recovery and device adherence periodically.

In this study, we have included the patients who were diagnosed as OSAS according to PSG applied at our sleep disorders center and under treatment with PAP device before pandemic for at least 1 year. We have compared the device adherence of the patients before COVID-19 pandemia and between the date of the first COVID-19 patient diagnosed at 27.03.2020 and the end of the curfew date at 01.07.2020. Patients with OSAS who never used a device or used irregularly or had a device use period of less than 1 year were excluded. Medical records included patients' age, gender, PSG results, psychiatric symptoms, other sleep disorders, device usage times. CPAP adherence during the same period in the year of 2019 was documented also.

Statistical Analysis

Statistical analysis was performed using SPSS for Windows (version 20.0; SPSS Inc, Chicago, Illinois). The Kolmogorov-Smirnov test was used to determine whether the data were normally distributed. Continuous data were expressed as mean

± standard deviation or median (interquartile range) while categorical data were presented as the number of patients and percentages. Student t-test or Mann-Whitney U test was used to compare parametric and non-parametric continuous variables, respectively. Pearson chi-square and Fisher's Exact tests were used for statistical evaluation of the categorical variables. Logistic regression analysis was performed to determinate the predictors of device adherence. A p-value <0.05 was considered statistically significant.

Results

A total of 190 patients were included in our study. One hundred-fifty five of the patients were male (81.6%) and 35 were female (18.4%). The average age of the patients was 50.2±11.8. According to the PSG results, mean AHI values were 44.3±26.4. Considering the usage times of the device, the average usage time before the pandemic was 5.3±0.6 hours, while the average device usage time after the pandemic was 4.5±0.9 hours. While the device usage time of 54 patients was over 4 hours before the pandemic, it was below 4 hours after the pandemic. Patients were divided into two groups such as patients with inadequate usage time (whose device usage time was <4 hours) and patients with adequate usage time (whose device usage time ≥4 hours). There was no difference in age and gender between the groups. When patients with adequate device usage time and patients with inadequate device usage time were compared, there was a significant difference between them in terms of age, gender, and mask problems. Insomnia and circadian rhythm disturbances were more common in the group with insufficient device compatibility (Table 1).

When examined in terms of psychiatric problems, anxiety and somatic symptoms were significantly higher in the group with insufficient device compatibility (Table 2). Multivariate logistic regression analysis was performed to determinate the predictors of device adherence. Presence of insomnia, circadian rhythm disturbances, and anxiety symptoms were independent predictors of device adherence (Table 3).

Discussion

In large cohort studies reported from China and Italy, people with COVID-19 infection had high comorbidity of hypertension, diabetes, and heart disease. These characteristics are often found in OSAS also. Approximately one-fourth of patients who have had COVID-19 pneumonia and developed intensive care need have a history of OSAS (20). Hypoxemia during sleep in both OSAS and obesity hypoventilation syndrome increases hypoxemia in COVID-19 pneumonia. It is thought that hypoxemia is deeper and cytokine storm develops in OSAS patients, especially accompanied by obesity (7). Furthermore, there are as yet unexplored potential mechanistic links between an imbalance of the angiotensin II receptor and angiotensin II converting enzyme (ACE2) and severe COVID-19 infections, which may also apply in sleep related breathing disorder (21). In OSAS patients, the cytokine storm may worsen COVID-19 pneumonia; acute respiratory distress syndrome (ARDS) and multi-organ failure may develop. ARDS is high in OSAS patients accompanied by obesity (22).

CPAP is an effective treatment of OSAS. Patients who use CPAP for more than 4 hours a night, more than 70% of the days using CPAP, are considered compatible with the treatment (23). However, half of the patients experience device compatibility problems (24). Many factors affect device compatibilities, such as mask problems, the presence of other sleep disorders, and psychological state. It is thought that many situations such as measures taken throughout the country during the COVID-19 pandemic, isolation, quarantine, digital work environments may have directly or indirectly affected device compatibility. In previous studies, low CPAP compliance has been shown in PTSD and additional sleep disorders (25). Different results were found in two studies on device compatibility during the COVID-19 pandemic process. Attias and colleagues evaluated device compatibility in the first month of the COVID-19 pandemic of 7.485 patients with OSAS; the usage time increased from 386 minutes before the pandemic to 401 minutes. They attributed this to conditions such as the fear of hospitalization, staying at home, not being exposed to air pollution, and reduced work stress due to cardiovascular risk factors in most OSAS patients (26). However, Batool-Anwar et al. (27) found no differences in hours of PAP use or self-

Table 1. Comparison of the socio-demographic and clinical characteristics between groups

	Inadequate device adherence (n=54)	Adequate device adherence (n=136)	p
Age (years)	50.7±11.2	50.0±12.1	0.730
Gender (male)	47 (87)	108 (79.4)	0.300
Mask problem	3 (5.6)	3 (2.2)	0.354
Nightmare disorder	3 (5.6)	1 (0.7)	0.070
Insomnia	14 (25.9)	2 (1.5)	**<0.001**
Circadian rhythm disorder	11 (20.4)	6 (4.4)	**0.001**

Table 2. Comparison of the psychiatric symptoms between groups

	Inadequate device adherence (n=54)	Adequate device adherence (n=136)	p
Depressive symptoms	1 (1.9)	0	0.284
Anxiety symptoms	12 (22.6)	6 (4.4)	**<0.001**
Somatic symptoms	3 (5.6)	1 (0.7)	0.070

Table 3. Multivariate logistic regression analysis to determinate predictors of device adherence

	Odds ratio	95% confidence interval	p
Insomnia	23.055	4.842-109.742	**<0.001**
Circadian rhythm disorder	4.037	1.221-13.349	**0.022**
Anxiety symptoms	4.963	1.575-15.644	**0.006**

reported sleep duration between before and after COVID-19 pandemic. They found that there was an increase in the number of patients with insomnia after the lockdown (27). In our study, the average duration of use, which was 5.3±0.6 hours before the COVID-19 pandemic, decreased to 4.5±0.9 hours after the pandemic.

Researchers in China investigated the psychological effects of the general population in the first phase of the COVID-19 outbreak. They found that 53.8% of respondents rated the psychological impact of the outbreak as moderate or severe, 16.5% reported moderate to severe depressive symptoms, and 28.8% reported moderate to severe anxiety symptoms (28). In our study, it was observed that depressive symptoms, anxiety symptoms, and somatic complaints were added in the COVID-19 pandemic process in OSAS patients. One study examined the relationship between personal social capital scale-16 and sleep quality in individuals who isolated themselves during the COVID-19 outbreak (1). It has been shown that anxiety is associated with stress and decreased sleep quality, and the presence of anxiety and stress reduces the positive effects of social capital on sleep quality. In a study conducted on 1.250 healthcare workers in China, 50.4% of the participants were found to have depression, 44.6% anxiety, and 34.0% insomnia (29). In our study, new insomnia cases were detected during the COVID-19 epidemic period.

Conclusion

In OSAS patients, sleep disorders such as insomnia, circadian rhythm disorder, nightmare disorder, depressive symptoms, and anxiety symptoms were observed during the COVID-19 pandemic period. These added complaints affected the device compatibility of OSAS patients. Being aware of the problems that may arise during the COVID-19 pandemic process and conducting studies on these issues will help the device compliance of patients with OSAS, a risky group.

Ethics

Ethics Committee Approval: This retrospective study was performed at the Sleep Disorders Center of the University of Health Sciences Turkey, Erenköy Mental and Neurological Diseases Training and Research Hospital. All study procedures were approved by the Local Ethics Committee and are compliant with the Declaration of Helsinki (no: 25, date: 06.07.2020).

Informed Consent: Informed consent was not obtained from patients, but patient identification information was hidden.

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Authorship Contributions

Concept: E.A.S., Design: F.M.D., Data Collection or Processing: R.K., Analysis or Interpretation: H.G., Literature Search: F.M.D., Writing: E.A.S.

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Erythrocyte Distribution Width and Central Corneal Thickness in Patients with Obstructive Sleep Apnea Syndrome

Obstrüktif Uyku Apne Sendromlu Hastalarda Eritrosit Dağılım Genişliği ve Santral Kornea Kalınlığının Değerlendirilmesi

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Abstract

Objective: Tissue hypoxia results in an increased erythrocyte distribution width (EDW) and secondary ocular complications in obstructive sleep apnea syndrome (OSAS). Thus, this study aimed to investigate the correlation between EDW and central corneal thickness (CCT) in patients with varying OSAS severities.

Materials and Methods: This study included 70 patients with OSAS (23 mild, 22 moderate, and 25 severe cases) and 30 healthy participants. EDW was measured using an automated blood cell counter. CCTs were measured by spectral-domain optic coherence tomography.

Results: The EDW values were significantly higher in patients with severe OSAS than with moderate (p=0.042) and mild (p=0.015) OSAS. Additionally, EDW values were significantly higher in the control group than in patients with mild (p=0.011) and moderate OSAS (p=0.038). The control group and the patient group did not significantly differ in the mean CCT values (p=0.45/p=0.14). No statistically significant correlation was found between EDW and CCT values in the control group (r=-0.22, p=0.25) or patient group (r=-0.1, p=0.63). The correlations between RDW and apnea-hypopnea index (r=0.334, p=0.001) and minimal oxygen saturation (r=-0.29, p=0.004) were statistically significant.

Conclusion: Our study revealed that EDW was higher in patients with OSAS than control group. Therefore, EDW can be used as an important diagnostic tool for the early diagnosis of atherosclerosis risk in patients with OSAS. The required metabolic activity for the sustainability of corneal transparency is thought to be affected by hypoxia in OSAS.

Keywords: Obstructive sleep apnea syndrome, erythrocyte distribution width, central corneal thickness

Öz

Amaç: Obstrüktif uyku apne sendromunda (OUAS) doku hipoksisi eritrosit dağılım genişliğinde (EDG) ve sekonder oküler komplikasyonlarda artışa neden olur. Bu çalışmada, değişik şiddetlerdeki OUAS hastalarında doku hipoksisine bağlı santral kornea kalınlıkları (SKK) ile EDG arasındaki ilişkinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Çalışmaya yaş ve cinsiyet yönünden benzer 23 hafif, 22 orta ve 25 ağır dereceli toplam 70 OUAS hastası ile eşlik eden komorbiditesi bulunmayan 30 sağlıklı birey alındı. EDG otomatik kan sayım cihazı kullanılarak, SKK ise spektral optik koherans tomografi yöntemi ile ölçüldü.

Bulgular: Ağır OUAS hastalarında EDG değerleri, orta (p=0,042) ve hafif (p=0,015) hastalara oranla daha yüksekti. Kontrol grubunda EDG, hafif OUAS (p=0,011) ve orta OUAS (p=0,038) gruplarına kıyasla istatistiksel olarak anlamlı daha yüksekken, ortalama SKK değerleri arasında anlamlı fark yoktu (p=0,45/p=0,14). Kontrol grubu (r=-0,22 p=0,25) ile hasta grubu (r=-0,1 p=0,63) arasında EDG ve SKK değerleri arasında istatistiksel olarak anlamlı bir korelasyon yoktu. EDG'nin, apne-hipopne indeksi (r=0,334, p=0,001) ve minimum oksijen satürasyonu (r=-0,29, p=0,004) ile korelasyonu istatistiksel olarak anlamlıydı.

Sonuç: Çalışmamızda OUAS hastalarında EDG'nin kontrol grubuna göre daha yüksek olduğunu bulduk. Bu nedenle EDG, OUAS'li hastalarda ateroskleroz riskinin erken teşhisi için önemli bir tanı aracı olarak kullanılabilir ve OUAS'de hipoksi korneal saydamlık için gerekli olan metabolik aktiviteyi etkilemektedir.

Anahtar Kelimeler: Obstrüktif uyku apne sendromu, eritrosit dağılım genişliği, santral korneal kalınlık

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Introduction

Obstructive sleep apnea syndrome (OSAS) is a disease characterised by full (apnea) or partial (hypopnea) upper respiratory tract obstruction episodes repeating during sleep, and frequently a decrease in blood oxygen saturation (1).

It is considered that OSAS is not only a respiratory disorder that involves apnea and hypopnea, but should also be taken as a disease accompanied by systemic inflammation. The desaturation and reoxygenation cycles occurring during sleep cause a reperfusion damage, giving rise to the release of pro-inflammatory cytokines (2). As the severity of the OSAS and the duration of hypoxia increase, so do the emerging inflammatory cytokines (3).

Episodic hypoxia episodes form the basis of the pathogenesis of ocular complications in OSAS. Ischemia-reperfusion damage, hypercoagulability, the production of free radicals, endothelial dysfunction, direct anoxic damage to the optic nerve, changes in blood pressure, and excessive sympathetic activity cause indirect optic nerve damage (4,5). An interrelation between OSAS and ophthalmic pathologies such as glaucoma, keratoconus, papilledema, optic neuropathy and non-arteritic ischemic optic neuropathy has been reported in the literature (6,7).

The reflection of the systemic inflammation caused by acute hypoxia to the bone marrow affects erythropoiesis, and induces an increase in serum erythropoietin (EPO), and the formation of red blood cells (RBCs). The presence of large RBCs disrupts the erythrocyte distribution width (EDW), resulting in an increase in the EDW (8).

Since EDW is sensitive to even a small amount of large RBCs, it can be used to study its relation with diseases caused not only by acute hypoxia, but also episodic or chronic hypoxia. It is known that an increase in EDW together with other inflammatory cytokines represents an increased risk factor for cardiovascular diseases (9,10). EDW is considered to be the memory of chronic and serious diseases through hypoxia (11). Therefore, EDW can be used as an important diagnostic tool for the early detection of ocular complications caused by atherosclerosis and hypoxia in patients with OSAS. It has been postulated that during respiratory events in the sleep, recurrent episodes of hypoxemia and hypercapnia may increase the intracranial pressure and sympathetic activation which contribute to the development of ocular pathology (7). Knowledge of these corneal abnormalities due to sleep disturbances and hypoxemia may assist in communication between ophthalmologists and sleep specialists, thereby preventing ocular complications in patients with OSAS. This study aims at evaluating the correlation between EDW and corneal thickness caused by tissue hypoxia in patents with OSAS.

Materials and Methods

Participants and study design

One hundred patients subjected to all-night polysomnography (PSG) between January 2018-February 2019 at the Bahçeşehir University Faculty of Medicine Hospital Sleep Laboratory due to an OSAS diagnosis participated in this study after their informed consents were obtained.

One hundred subjects similar in terms of age and gender were divided into four groups according to their apnea-hypopnea index (AHI) results. Based on their AHI scores, patients were categorized in control group (AHI <5), mild (AHI=5-15), moderate (AHI=15-30), and severe OSAS (AHI>30) groups according to American Academy of Sleep Medicine (AASM) task force criteria (12).

- Thirty cases under 5: Control group,
- Twenty-three cases between 5-15: Mild OSAS group,
- Twenty-two cases between 15-30: Medium OSAS group
- Twenty-five cases above 30: Severe OSAS group.

As a control group, 30 asymptomatic healthy individuals without cardiovascular diseases who visited department of neurology outpatient clinic for check-up were enrolled in to the study.

Exclusion criteria were as follows: Impaired cardiopulmonary function, defined as the occurrence of respiratory failure, pulmonary infection or congestive heart failure; hypertension, diabetes mellitus, using antihypertensives, antidiabetics and lipid-lowering treatment; chronic alcoholism and smoking; malignancy, hyperthyroidism and hypothyroidism; history of prolonged use of non-steroid anti-inflammatory drugs or anticoagulants; renal and liver insufficiency; known hematologic disease such as leukemia or myelodysplastic syndrome; a history of recent blood transfusion; active infections, psychiatric sleep disorders, sleep respiratory dysfunctions other than OSAS (central sleep apnea or Cheyne Stokes respiratory and upper airway resistance syndrome); those having a history of eye operation, refractive laser surgery, contact lens implantation, corneal disease, ocular trauma, vasculitis, dry eye syndrome, keratoconus; use of anti-glaucoma medication, and ocular hypertension; those under 18 years of age.

Polysomnographic evaluation

The gold standard for diagnosing OSAS is PSG performed at sleep laboratories (13). An AHI of over 5 found by PSG performed on a patient with symptoms such as snoring, witnessed apnea, and excessive daytime sleepiness is considered diagnostic.

Subjects complaining of snoring and excessive daytime sleepiness were subjected to all-night PSG at our sleep laboratory, using our 48-channel device (MiniScreen, Löwenstein Medical, Germany). Electrooculogram (dual-channel), electroencephalography (6 channels, C4-M1, F4-M1, O2-M1, C3-M2, F3-M2, O1-M2), electromyogram from the submental muscle (1 channel), leg movements from the bilateral anterior tibial muscle (2 channels), electrocardiogram, airflow (oronasal thermistor and nasal cannula), body position sensor and snoring sensor records, and video monitorisation were obtained from all subjects. Arterial oxygen saturation recordings were made at chest and abdominal muscles by means of respiratory effort (2 channel) straps and pulse oximetry. All PSG records were manually scored according to the AASM criteria (14) at 30-second epochs. Apnea was scored as a minimum 10-second drop in ≥90% airway amplitude, and hypopnea as a 10-second

drop in ≥30% airway amplitude and ≥3% oxygen desaturation. AHI represents the number of apnea and hypopnea in 1 hour of sleep, and subjects with AHI >5 were identified as the OSAS group, and those with AHI<5 as the control group.

Ophthalmic measurement

After the subjects' pupils were dilated using topical procaine hydrochloride 0.5% (Alcon-Couvreur; Puurs, Belgium), their central corneal measurements were taken three times using ultrasonographic pachymeter (Opticon 2000 SPA; Pacline, Rome, Italy). In the recent years, optical coherence tomography (OCT) has stood out as an important diagnostic imaging technology especially for retinal diseases and glaucoma. This technology is capable of displaying pathologies on the retina that are hardly noticeable through fundoscopy, in high-resolution images (15). In ophthalmology, OCT is used also in examining other tissues as well as for viewing the retina. It is possible to evaluate central corneal thickness (CCT) and the thickness of the cornea epithelium using anterior segment OCT (16).

EDW

After the PSG records of all subjects were taken, their EDWs were measured using an automatic blood cell count device on their blood taken in the morning. Their EDW measurements were performed using a Beckman Coulter LH-750 Hematology Analyzer (Beckman Coulter, Inc., Fullerton, CA, USA) device. The normal reference values for EDW in our laboratory are in the range of 11.6 and 16.5%.

This research was approved by the Ethics Committee of the Faculty of Medicine, Bahçeşehir University (date: 03.04.2019, number: 2019-07/01) and was conducted according to principles of the Declaration of Helsinki.

Statistical Analysis

The data were analysed using the SPSS packaged software. The continuous variables were given as ± standard deviation. The One-Way Analysis of Variance (ANOVA, post hoc: Tukey HSD for multiple comparisons) was performed for comparing independent group variances. The Spearman correlation analysis was employed for examining the correlation between variables.

Results

The demographic and clinical profile and polysomnographic parameters of the subjects are shown in Table 1.

The mean age of patients with moderate and severe OSAS was higher than that of mild OSAS and controls (p=0.002). Patients with moderate and severe OSAS had higher arousal index and Epworth score (p=<0.0001, p=0.046), mean oxygen saturation was found to be lower, although not statistically significant. Body mass index (BMI) increased with disease severity and it was found to be higher than the control group (p<0.0001) (Table 1).

The EDW values were 12.6±0.74 in mild OSAS group, 12.75±0.77 in moderate OSAS group and 13.5±1.67 in severe OSAS group. The difference was significant when mild and severe OSAS groups were compared (p=0.015), the moderate and severe OSAS groups' EDW results were also significantly different (p=0.042) (Table 1).

The EDW values of mild OSAS and control groups were significantly different (p=0.011). P-value was also significant between moderate OSAS and control groups (p=0.038).

Mean corneal thickness was measured as 540.92±33.7/543.68±29.1 µm for the OSAS group, and as 533.83±34.43/529.4±43.15 µm for the control group (p=0.45/p=0.14), the difference between the two groups not having been considered statistically significant as shown in Table 2.

In the patient group, the correlation between the EDW values and the AHI (r=0.334, p=0.001), the lowest oxygen saturation (r=-0.29, p=0.004) and BMI (r=0.338, p=0.004) was found statistically significant (Table 3) (Figure 1, 2).

Discussion

In this study, we evaluated the EDW values and corneal thickness, and the relation between them, in control group and mild, medium and severe OSAS patients. In our study we found

Table 1. Demographic and polysomnographic data

	Control (n=30)	Mild (n=22)	Medium (n=23)	Severe (n=25)	p*
Age (years)	42.1±2.4	46.7±13.41	55.5±13.1	52.16±11.5	0.002
Gender Female Male	 18 9	 4 18	 6 16	 9 17	**0.004**
Aurosal index (RERA)	5.7±11.6	15.9±9.9	26.2±12.6	30.9±9.9	**<0.0001**
AHI	1.6±1.2	8.8±3	21.5±4.2	66.8±30.5	**<0.0001**
Min. SpO_2 (%)	85.14±17.5	83.74±6.3	81.05±6.9	66.04±13.3	**<0.0001**
Mean SpO_2 (%)	96.10±17.8	94.13±2.3	93.68±1.8	90.24±4.7	0.531
Epworth scale	6 (1-22)	8 (1-19)	6 (2-15)	9.5 (1-21)	**0.046**
BMI (kg/m²)	26.46±5.71	28.87±3.05	28.36±3.86	33.36±6.86	**<0.0001**
EDW (%)	13.05±0.8	12.61±0.7	12.75±0.8	13.57±1.7	**0.014**
Hgb (g/L)	12.97±1.7	14.33±1.4	13.79±1.5	13.70±1.8	**0.026**

AHI: Apnea-hypopnea index, BMI: Body mass index, EDW: Erythrocyte distribution width, Min. SpO_2: Lowest oxygen saturation

that the EDW was greater in OSAS patients compared to the control group. Also, the EDW values of severe OSAS patients were statistically higher compared to those of mild and medium OSAS patient groups. However, patient and control groups did not show a significant difference with regard to corneal thickness.

The fact that the mean age of patients with moderate and severe OSAS was higher than that of mild OSAS and controls is due to the increase in disease severity with age. Increase in aurosal index, decrease in mean oxygen saturation and increase in Epworth score also resulted as expected in severe and moderate OSAS patients. Since BMI increases with disease severity, it was found to be higher in OSAS group than the control group which was in line with previous studies (17,18).

The desaturation and reoxygenation cycles emerging during sleep causes reperfusion damage. Pro-inflammatory cytokines are released as a result of developing hypoxia and sympathetic discharge (2,3). The reflection of systemic inflammation to the bone marrow causes EPO activation, giving rise to erythrocyte heterogeneity, which, in turn, results in an increase in EDW (3). In our study, while an increase was found also in the EDW's values of medium and severe OSAS patients with a high AHI, an inverse proportion was found with minimum oxygen saturation. Similar studies carried out in the past also support our findings. EDW may not be an ideal indicator for hypoxia. EDW's potential of being sensitive to hypoxic events does denote high specificity. EDW increase is also present in acute bowel diseases, anaemia and goitre. EDW is also expected to increase in methotrexate, the use of nucleoside transcriptase inhibitors, and alcohol poisoning.

The onset of a hypoxic disease contributes to the patient's pre-existing hypoxic load. Therefore, a patient with cardiac insufficiency and chronic obstructive pulmonary disease will be less defensive against hypoxemia secondary to pneumonia. Since EDW is a sensitive indicator of hypoxic load, it may provide information on morbidity and mortality (19-22).

Table 2. Corneal thickness in the participants

Corneal thickness	Control	OSAS	p
Right	533.83±34.43	540.92±33.7	0.45
Left	529.4±43.15	543.68±29.1	0.14

OSAS: Obstructive sleep apnea syndrome

Table 3. Correlation of the EDW values and the polysomnographic and clinical parameters

	EDW values	
	r*	p
AHI	0.334	**<0.0001**
Min. SpO_2 (%)	-0.29	**0.004**
BMI	0.338	**<0.0001**
RERA	-0.13	0.11

*Pearson correlation constant, AHI: Apnea-hypopnea index, BMI: Body mass index, EDW: Erythrocyte distribution width, Min. SpO_2: Lowest oxygen saturation

In ophthalmology, the measurement of CCT is clinically very important for the preoperative evaluation of patients prior to refractive surgery (23,24). Ophthalmologists currently use ultrasound pachymetry (UP) to measure corneal thickness. The advantages of UP are its accessibility and portability, and it may also be used for evaluating normal corneas (25).

Being a transparent tissue, the cornea is one of the most important steps of the optic function. Oxygen is an important parameter for the metabolic activity ensuring the continuation of cornea transparency. Anaerobic glycosis increasing due to hypoxia causes stromal oedema in the cornea. Long-lasting stromal oedema causes changes in keratocyte morphology and functions. Studies have demonstrated that an approximately 2% thinning occurs in the cornea even after the disappearance

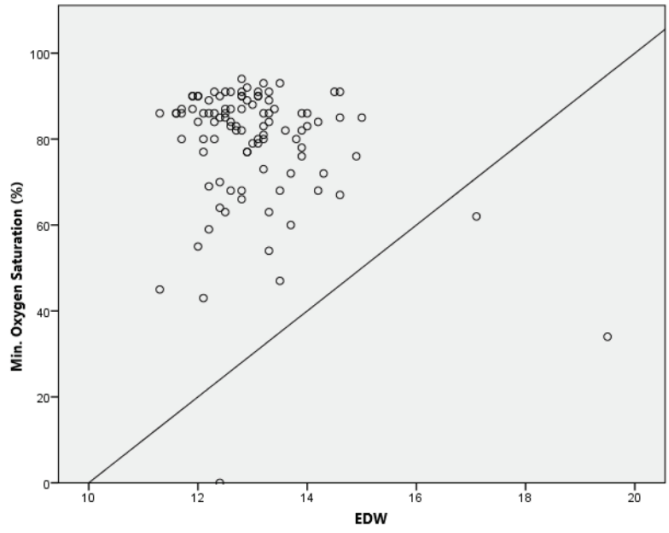

Figure 1. Correlation between the EDW values and the lowest oxygen saturation

EDW: Erythrocyte distribution width

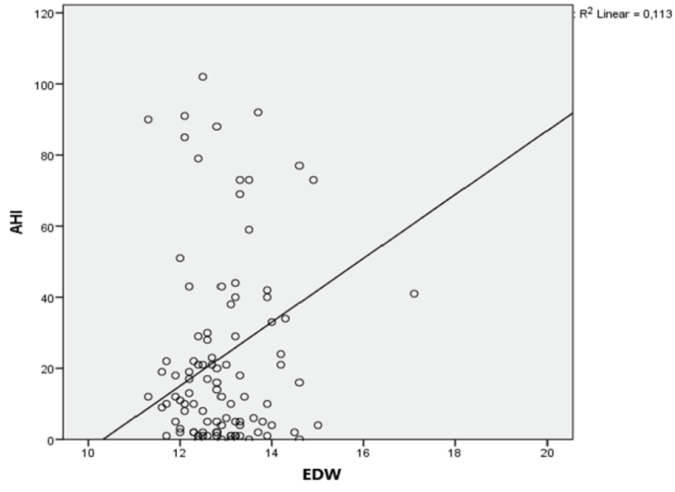

Figure 2. Correlation between the EDW values and apnea-hypopnea index

EDW: Erythrocyte distribution width

of the corneal oedema (26,27). Akbulut et al. (28), in a study in which they researched OSAS patients' proclivity to glaucoma, found no distinct thinning in the measured corneal thicknesses of OSAS patients. Koseoglu et al. (29) reported that corneal thicknesses decreased in the OSAS group compared to the control group. It was found that CCT decreases as OSAS severity increases. Our study, however, found no significant difference between the OSAS groups and the control group in terms of corneal thickness. The reason for this may be the smaller number of the patients participating in our study. Therefore, studies with greater numbers of patients in which the systemic effects in OSAS and the impact of tissue hypoxia on the cornea are evaluated would be useful.

In several studies, optic nerve damage caused by hypoxia has also been demonstrated in OSAS in addition to corneal thinning (30). Purvin et al. (31) suggested that OSAS may cause papilledema and visual impairment due to an increase in intracranial pressure caused by episodic nocturnal hypoxemia. Karakucuk et al. (32) demonstrated field of vision defects secondary to optic nerve damage caused by cerebral ischemia in OSAS patients in spite of normal ophthalmological examination. Acute bleeding provoking EPO-guided erythropoiesis is followed by increases in RDW, but not mean cell volume. Similar increases in RDW are followed by many acute diseases with a risk of hypoxia, including cardiac insufficiency, pneumonia, atelectasis, pulmonary embolism, pneumothorax, and sepsis. The peaks reach maximum within 1 month following onset, and drop to pre-disease levels approximately 6 months later. In contrast to iron deficiency anaemia (IDA), no noticeable change in the average RBC dimension accompanies RDW increases following diseases related to hypoxia.

While statistically insignificant, it is believed that the metabolic activity required for maintaining corneal transparency is affected by the hypoxia caused by OSAS. In OSAS, the pathogenesis of ocular complications has a multifactor origin with ischemia-reperfusion damage, hypercoagulability, the production of free radicals, and increased oxidation. Indirect optic nerve damage emerges secondary to stress, endothelium dysfunction, direct anoxic damage to the optic nerve, changes in blood pressure, and sympathetic excess activity.

Study Limitations

The limitations of our study were the lack of knowledge on the time of the onset of OSAS symptoms and systemic effect, the small number of participants, and the BMI difference between the groups. Excluding individuals with known diseases other than OSAS suggests that the obtained results developed in connection with OSAS' systemic effects.

Conclusion

The results of this study revealed that patients with OSAS have higher EDW values. EDW showed a positive correlation with AHI but an inverse correlation with the lowest oxygen saturation. Therefore, EDW might be used as a severity marker of OSAS and it could provide an inexpensive and easy tool for evaluating OSAS patients in terms of potential tissue hypoxia- associated diseases. Prospective studies with larger populations are needed to confirm EDW and CCT as a useful severity assessment tool in OSAS.

Ethics

Ethics Committee Approval: This research was approved by the Ethics Committee of the Faculty of Medicine, Bahçeşehir University (date: 03.04.2019, number: 2019-07/01) and was conducted according to principles of the Declaration of Helsinki.
Informed Consent: Informed consent was obtained.
Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: F.Y., R.İ., G.K., Design: F.Y., R.İ., G.K., Data Collection or Processing: F.Y., R.İ., G.K., Analysis or Interpretation: F.Y., R.İ., G.K., Literature Search: F.Y., R.İ., G.K., Writing: F.Y., R.İ., G.K.
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Anxiety and Sleep Quality Levels of Emergency Medical Personnel and Factors Affecting Them During the Coronavirus Disease-2019 Pandemic

COVID-19 Pandemisinde Acil Servis Çalışanlarının Anksiyete ve Uyku Kalitesi Düzeyleri ve Etkileyen Faktörlerin Belirlenmesi

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Abstract

Objective: The study was conducted to determine the anxiety and sleep quality levels of emergency medical service personnel as well as factors affecting them during the Coronavirus disease-2019 (COVID-19) pandemic.

Materials and Methods: This descriptive study included 247 medical professionals working in emergency medical services.

Results: The mean age of the medical personnel was 32.62±7.36 years, of whom 54.3% were females, 49.8% were married, 89.9% were university graduates and 47.8% nurse. Of the medical staff, 21.9% had mild anxiety, 15.8% had moderate anxiety, and 33.2% had high anxiety. Pittsburgh sleep quality index scores of all participants were >5. A strong and positive relationship ($p<0.001$) was found between the anxiety level (19.24±15.67) and sleep quality (14.39±3.13) of participants. The study revealed that healthcare personnel who worked 24 hour shifts, smoked and/or drank alcohol, had a psychological disorder, and lacked adequate protective equipment had high anxiety scores and poor sleep quality. Moreover, healthcare professionals who experienced problems with childcare, thought that working conditions affect their children negatively, and were afraid of COVID-19 transmission to themselves and their families had high anxiety scores and poor sleep quality.

Conclusion: During the pandemic, monitoring the emergency medical personnels' health and work is important to determine their levels of anxiety and sleep quality and to provide necessary psychological support.

Keywords: Emergency medical services, anxiety, COVID-19 pandemic, medical personnel, sleep quality

Öz

Amaç: Bu çalışma, Koronavirüs hastalığı-2019 (COVID-19) pandemi döneminde acil servis çalışanlarının anksiyete ve uyku kalitesi düzeyleri ile etkileyen faktörleri belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı tipte olan bu araştırma acil servislerde çalışan 247 sağlık personeli ile yapılmıştır.

Bulgular: Yaş ortalamaları 32,62±7,36 olan sağlık personellerinin %54,3'ü (n=134) kadın, %49,8'i (n=123) evli, %89,9'u (n=222) üniversite mezunu ve %47,8'i (n=118) hemşire idi. Sağlık personelinin %21,9'u hafif, %15,8'i orta ve %33,2'si yüksek anksiyete düzeyine sahipti. Katılımcıların tamamının Pittsburgh uyku kalitesi indeks puanı 5'in üzerinde idi. Katılımcıların anksiyete düzeyi (19,24±15,67) ile uyku kalitesi (14,39±3,13) arasında kuvvetli ve pozitif yönde ilişki saptandı. Çalışmada; 24 saatlik vardiyalar halinde çalışan, sigara ve/veya alkol kullanan, psikolojik bir hastalığı olan ve yeterli koruyucu ekipmana sahip olmadığını belirten sağlık personellerinin anksiyete puanlarının yüksek, uyku kalitelerinin kötü olduğu saptandı. Ek olarak, çocuklarının bakımı ile ilgili sorun yaşayan, çalışma şartlarının çocuklarını olumsuz etkilediğini düşünen, kendisine ve ailesine COVID-19 bulaşmasından korkan sağlık personellerinin anksiyete puanları yüksek, uyku kaliteleri kötü idi.

Sonuç: Pandemi döneminde sağlık personellerinin çalışma şeklinin yeniden gözden geçirilmesi, anksiyete ve uyku kalitelerinin belirlenerek gerekli psikolojik desteğin sağlanması önemlidir.

Anahtar Kelimeler: Acil servis, anksiyete, COVID-19 pandemisi, sağlık personeli, uyku kalitesi

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Introduction

Pandemics are unpredictable situations that can negatively affect people (1,2), these effects are physical, social and psychological (3). The occupational group that is thought to be most affected from the pandemic is medical personnel (2,4-9), while the institutions most impacted are hospitals. During a pandemic, all the normal functions of hospitals, and especially of the emergency medical services, areaffected (3). The Coronavirus disease-2019 (COVID-19) pandemic, whose effects are still on going, has been a case in point. Emergency medical services are often the first point of contact for individuals who present with symptoms of COVID-19. As COVID-19 spreads and mortality rates grow, so the work load, and physical and psychological fatigue of those working in the emergency medical services also increases. There remains, however, a profound need for medical personnel in order to combat the pandemic, and it is necessary that they are both protected and able to carry out their duties. The physical and psychological health of these individuals should be closely monitored and any problems identified should be solved quickly and at an early stage (10).

During the pandemic, anxiety and deterioration in sleep quality have been among the most common negative consequences experienced by medical personnel (5-7). Healthcare personnel who work in the front line and have to work in close contact with individuals diagnosed with COVID-19 may have higher state and trait anxiety levels and health concerns (9). It should be kept in mind that sleep problems that increase with anxiety can lead to deepening psychological disorders (11). Since the problem-solving skills of medical personnel who experience anxiety and sleep disorders are negatively affected, their quality of life may also deteriorate severely (12). This may reduce their motivation to carry out their professional responsibilities (13). It is important that the sleep quality and anxiety levels of medical personnel remain within acceptable limits so that adequate medical services can continue to be provided. During the pandemic only, no study could be found focusing only on those working in emergency medical services in the literature. There is also no study examining the effect of the status of having problems with childcare during the pandemic period and the status of being affected by the pandemic in terms of their communication with their children on the anxiety and sleep quality of healthcare personnel.

This study was carried out to determine the anxiety and sleep quality levels of adult and/or pediatric emergency service personnel and the factors affecting them during the COVID-19 pandemic.

Materials and Methods

Type of Research

This was a descriptive, cross-sectional study.

Place and Duration of the Study

The research was carried out in Turkey via the survey method between 21 August and 21 September 2020. In the period of the study, the number of people diagnosed with COVID-19 in Turkey varied between 1204 and 1742. Mortality rates ranged between 18 and 65 per day.

Sampling

In the study, there was no sample selection and questionnaires were sent to the entire universe. The research was completed with 247 medical staff who agreed to participate, who were working in the adult and/or pediatric emergency services, and who met the inclusion criterion. This criterion; Being 18 years old or older, working in the emergency services in Turkey, accepting to participate in the study, giving informed consent, answering all the questions in the questionaire completely.

Data Collection Tools

The data were collected using the descriptive information form, the Beck anxiety scale, and the Pittsburg sleep quality index (PSQI).

Introductory information form: This form was prepared by the researchers in line with the literature (4-7). The form contains questions to determine the socio-demographic and occupational characteristics of the medical personnel and their working conditions during the COVID-19 outbreak.

The Beck anxiety scale: This scale was developed by Beck et al. (14). Cronbach's Alpha coefficient is 0.93. The scale was adapted to Turkish by Ulusoy et al. (15) and the scale consists of 21 questions which aim to measure the severity of an individual's anxiety, and is a four-point Likert-type scale. The level of anxiety is "mild" if the total score from the scale is between 8 and 15 points, "moderate" if it is between 16 and 25 points, and "high" if it is between 26 and 63 points.

PSQI: The PSQI was developed Buysse et al. (16) to evaluate sleep quality and sleep disturbances experienced by individuals in the previous month. The PSQI was adapted to Turkish by Agargun et al. (17) and the Cronbach Alpha coefficient was found to be 0.80. The PSQI consists of 24 questions and the total score ranges from 0 and 21. Each question is scored between 0-3. A total score greater than 5 indicates "poor sleep quality''.

Data Collection

The data were collected online via WhatsApp using the survey method. The questionnaire was shared in the Whatsapp groups in which there were chief physicians of all emergency services in Turkey (n=1514). Chief physicians were asked to share this questionnaire with all of the healthcare personnel in their departments.

Ethical Aspect of the Research

Before beginning the research, the necessary permission was obtained from the Ministry of Health (dated 11.06.20 and numbered 2020-06-06T11_00_45), as well as from the ethics committee permission (dated 14.08.2020 and numbered E-25403353-050.99-77351). The study was carried out with voluntary participants.

Statistical Analysis

Data are expressed as n, percentage, average, standard deviation, and minimum and maximum values. The Shapiro-

Wilk test was used to test the compliance of the data to normal distribution. The Mann-Whitney U and Kruskal-Wallis H tests were applied to data sets that were not normally distributed and consisted of independent variables. The Spearman and Pearson Correlation tests were applied to non-normally distributed data sets to determine the relationships and directions between variables. Analyses were performed using the IBM SPSS 21.0 (IBM Corporation, Armonk NY, USA) program. P<0.05 was considered statistically significant in the study.

Results

The ages of the participants ranged from 20 to 62 and their average age was 32.62±7.36. 54.3% of the participants (n=134) were female, 49.8% (n=123) were married, 89.9% (n=222) were university graduates, 95.1% (n=235) lived in nuclear families, 44.1% (n=109) had children and the income of 57.9% (n=143) was found to be equal to their expenditure (Table 1). Table 1 includes the sociodemographic characteristics of the participants.

In Table 2 and 3, shows a comparison of some characteristics of the medical personnel and their PSQI and Beck anxiety scores. It was determined that the personnel who smoked, drank alcohol and had psychological diseases had poor sleep quality (Table 2) and high anxiety scores (Table 3).

In Table 4 and 5, shows a comparison of some characteristics of the medical personnel related to their work and COVID-19 and their PSQI and Beck anxiety scores. In the study, the healthcare personnel working in 24-hour shifts, being afraid of being infected with COVID-19, thinking they needed psychological support and having inadequate protective equipment, had poor sleep quality (Table 4) and high anxiety scores (Table 5). The healthcare personnel who had problems with childcare and who thought that working conditions negatively affected their children, also had poor sleep quality (Table 4) and high anxiety scores (Table 5). The healthcare professionals working more than 46 hours a week and only in the pediatric emergency care services, had worse sleep quality (Table 4).

The average Beck anxiety score of the participants in the study was 19.24±15.67. 21.9% (n=54) of the medical staff had mild anxiety, 15.8% (n=39) of them had moderate anxiety, and 33.2% (n=82) of them had high anxiety. The mean PSQI score of the participants was 14.39±3.13. All the PSQI scores of the participants (n=247, 100%) were greater than 5. There was a strong and positive correlation (r=0.586; p<0.001) between the medical personnel's mean Beck anxiety scores and their mean PSQI scores.

Discussion

Comparison of the Participants' Characteristics and PSQI Scores

The present study determined that the sleep quality of the participants diagnosed with a chronic disease and/or psychological illness was worse than that of the other personnel. Similar to the results of this study, other studies found that the sleep quality of medical personnel with chronic (18-20) or psychological disorders (18,21) had deteriorated. It is known that coronavirus has a more severe course in individuals with chronic diseases and that mortality rates are higher in these individuals. The poor sleep quality of medical personnel with chronic illnesses may be related to this situation. It was an expected result that the sleep quality of individuals with a

Table 1. Socio-demographic characteristics of the healthcare personnel

Variables		n	%
Age distribution	20-29 years	113	45.7
	30-39 years	83	33.6
	40-49 years	48	19.4
	50 years and above	3	1.2
Gender	Female	134	54.3
	Male	113	45.7
Marital status	Married	123	49.8
	Single	111	44.9
	Divorced	13	5.3
Educational status	High school	25	10.1
	Associate degree	33	13.4
	Bachelor's degree	118	47.8
	Master or above	71	28.7
Family structure	Nuclear family	235	95.1
	Extended family	12	4.9
The status of having children	Childless	138	55.9
	Having a child or children	109	44.1
Income level	Income<expenses	46	18.6
	Income=expenses	143	57.9
	Income>expenses	58	23.5
Occupation	Physician/specialist physician	79	32.0
	Nurse	118	47.8
	First aid and eemergency care technician	31	12.6
	Medical secretary	19	7.7
Years in the profession	<1 year	33	13.4
	Between 2-9 years	99	40.1
	10 years or above	115	46.6
The region of Turkey in which the participants worked	Central Anatolia	149	60.3
	Marmara	64	25.9
	Aegean	9	3.6
	Mediterranean	3	1.2
	Black Sea	4	1.6
	South East Anatolia	14	5.7
	East Anatolia	4	1.6
The hospital where the participant is working now	City hospital	114	46.2
	Public hospital	75	30.4
	University hospital	23	9.3
	Training and research hospital	31	12.6
	Private hospital	4	1.6

Table 2. Comparison of some characteristics of health personnel with PSQI scores				
Variable (n=247)	**n (%)**	**PSQI scores**		**p**
		Mean ± SD	**Min-max**	
Gender^{z}				
Female	134 (54.3)	14.51±2.80	8.17-21.00	p=0.70
Male	113 (45.7)	14.25±3.50	6.02-21.00	
Marital status$^{x^2}$				
Married	123 (49.8)	14.06±3.27	7.02-21.00	p=0.22
Single	111 (44.9)	14.79±2.94	6.02-21.00	
Divorced	13 (5.3)	14.15±3.25	9.02-19.00	
Smoking status^{z}				
Uses	136 (55.1)	14.95±3.13	7.02-21.00	**p=0.003**
Not using	111 (44.9)	13.72±3.02	6.02-19.75	
Alcohol drinking status^{z}				
Drinks	117 (47.4)	14.87±3.30	8.08-21.00	**p=0.023**
Not drinking	130 (52.6)	13.96±2.93	6.02-19.75	
Presence of diagnosed chronic diease^{z}				
Yes	36 (14.6)	15.66±2.98	8.17-19.75	**p=0.007**
No	211 (85.4)	14.18±3.12	6.02-21.00	
Presence of diagnosed psychological dieas^{z}				
Yes	20 (8.1)	16.34±2.92	9.17-21.00	**p=0.004**
No	227 (91.9)	14.22±3.10	6.02-21.00	

^{z}: Mann-Whitney U test, χ^2: Kruskal-Wallis H test, SD: Standard deviation, PSQI: Pittsburg sleep quality index

Table 3. Comparison of some characteristics of health personnel with Beck anxiety scores				
Variable (n=247)	**n (%)**	**Beck anxiety scores**		**p**
		Mean ± SD	**Min-max**	
Gender^{z}				
Female	134 (54.3)	20.81±15.02	0.00-61.00	**p=0.02**
Male	113 (45.7)	17.38±16.28	0.00-63.00	
Marital status$^{x^2}$				
Married	123 (49.8)	17.72±15.42	0.00-59.00	p=0.19
Single	111 (44.9)	20.89±15.99	0.00-63.00	
Divorced	13 (5.3)	19.53±14.95	4.00-49.00	
Smoking status^{z}				
Uses	136 (55.1)	23.18±16.70	0.00-63.00	**p<0.001**
Not using	111 (44.9)	14.14±12.80	0.00-52.00	
Alcohol drinking status^{z}				
Drinks	117 (47.4)	23.51±17.49	0.00-63.00	**p=0.001**
Not drinking	130 (52.6)	15.40±12.71	0.00-53.00	
Presence of diagnosed chronic diease^{z}				
Yes	36 (14.6)	22.13±15.67	0.00-59.00	p=0.16
No	211 (85.4)	18.74±15.65	0.00-63.00	
Presence of diagnosed psychological diease^{z}				
Yes	20 (8.1)	26.15±15.15	1.00-52.00	**p=0.02**
No	227 (91.9)	18.63±15.60	0.00-63.00	

^{z}: Mann-Whitney U test, χ^2: Kruskal-Wallis H test, SD: Standard deviation

diagnosed psychological disorder would be negatively affected during the pandemic, given that even individuals who have not previously experienced any psychological problems may develop symptoms of these (11,22).

The study determined that the sleep quality of cigarette smokers and alcohol drinkers was worse than that of others. Studies have shown that of those who smoke cigarettes (20,23-25) and drink alcohol (20,24,25) have a lower sleep quality than those who do not. The results of this study and other studies are important in terms of showing that the sleep quality in cigarette smokers and alcohol drinkers is also disturbed and that these people should receive psychological support.

The study determined that the sleep quality of medical personnel working in pediatric emergency clinics was worse

Table 4. Comparison of healthcare personnel's work characteristics and some characteristics related to COVID-19 with PSQI				
Variable (n=247)	**n (%)**	**PSQI scores**		**p**
		Mean ± SD	**Min-max**	
Title$^{\chi^2}$				
Doctor	79 (32.0)	14.48±3.28	8.17-19.75	p=0.87
Nurse	118 (47.8)	14.29±3.10	6.02-21.00	
First and emergency aid technician	31 (12.6)	14.71±3.10	8.17-19.33	
Medical secretary	19 (7.7)	14.12±2.98	8.25-19.00	
Working year in the profession$^{\chi^2}$				
≤1 year	33 (13.4)	14.67±3.57	6.02-21.00	p=0.62
2≤ years ≤9	99 (40.1)	14.58±2.89	8.17-19.75	
≥10 years	115 (46.6)	14.15±3.21	4.02-21.00	
Emergency department$^{\chi^2}$				
Adult emergency	147 (59.5)	13.94±3.20	6.02-21.00	**p=0.02**
Pediatric emergency	41 (16.6)	15.30±2.83	8.25-19.75	
Adult and pedatric emergency	59 (23.9)	14.88±3.00	9.02-19.67	
Working style for the last 1 month$^{\chi^2}$				
Daytime shift	33 (13.4)	13.20±2.13	8.17-17.50	**p=0.002**
Day and night shifts	97 (39.3)	14.11±2.90	8.17-19.75	
24 hour shift	117 (47.4)	14.96±3.44	6.02-21.00	
Working hours per week^{Z}				
≤45 hours	92 (37.2)	13.76±3.21	6.02-21.00	**p=0.01**
≥46 hours	155 (62.8)	14.77±3.04	8.17-19.75	
Fear of infection with the COVID-19 virus^{Z}				
Yes	213 (86.2)	14.61±3.04	6.02-21.00	**p=0.009**
No	34 (13.8)	13.01±3.39	8.02-19.50	
Fear of infecting their family with the COVID-19 virus^{Z}				
Yes	238 (96.4)	14.48±3.07	6.02-21.00	p=0.06
No	9 (3.6)	12.05±4.13	8.08-17.75	
The state of thinking that he/she should get psychological support during this period^{Z}				
Yes	138 (55.9)	15.33±2.93	6.02-21.00	**p<0.001**
No	109 (44.1)	13.20±2.99	8.02-19.67	
The state of thinking that he/she has adequate personal protective equipment while working^{Z}				
Yes	177 (71.7)	13.87±2.99	7.02-21.00	**p<0.001**
No	70 (28.3)	15.71±3.12	6.02-19.75	
Those with children (n=109, 44.1%); having problem/problems with their children's care in the last weeks^{Z}				
Yes	61 (55.9)	15.36±2.86	7.02-21.00	**p<0.001**
No	48 (44.1)	12.32±2.91	7.50-19.00	
Those with children (n=109, 44.1%); Thinking that working conditions in the last weeks negatively affect their children^{Z}				
Yes	83 (76.1)	14.82±3.05	7.50-21.00	**p<0.001**
No	26 (23.9)	11.46±2.46	7.02-16.50	

^{Z}: Mann-Whitney U test, $^{\chi^2}$: Kruskal-Wallis H test, SD: Standard deviation, COVID-19: Coronavirus disease-2019, PSQI: Pittsburg sleep quality index

than that of those working in adult emergency and adult + child emergency clinics. There is no research finding on this subject in the relevant literature. Providing care and treatment for sick children can be highly emotionally demanding for medical personnel. The result obtained in the current study can be associated with this situation.

It was found that the sleep quality of participants working 24 hours a day and whose working hours were more than 45 hours per week was worse than the others. The sleep quality of emergency service personnel (20,26,27) and intensive care personnel (28) was affected negatively due to the increase in their working hours in the studies before the pandemic.

Table 5. Comparison of healthcare personnel's work characteristics and some characteristics related to COVID-19 with Beck anxiety scores

Variable (n=247)	n (%)	Beck anxiety scores		p
		Mean ± SD	Min-max	
Title$^{\chi^2}$				
Doctor	79 (32.0)	22.16±18.91	0.00-61.00	p=0.65
Nurse	118 (47.8)	17.91±13.07	0.00-63.00	
First and emergency aid technician	31 (12.6)	18.06±13.82	1.00-47.00	
Medical secretary	19 (7.7)	17.26±17.94	1.00-59.00	
Working year in the profession$^{\chi^2}$				
≤1 year	33 (13.4)	20.72±13.40	4.00-524.00	p=0.21
2≤ years ≤9	99 (40.1)	20.52±16.93	0.00-63.00	
≥10 years	115 (46.6)	17.71±15.12	0.00-53.00	
Emergency department$^{\chi^2}$				
Adult emergency	147 (59.5)	16.95±14.07	0.00-63.00	**p=0.01**
Pediatric emergency	41 (16.6)	18.34±13.97	1.00-59.00	
Adult and pedatric emergency	59 (23.9)	25.57±18.81	0.00-61.00	
Working style for the last 1 month$^{\chi^2}$				
Daytime shift	33 (13.4)	14.69±11.00	0.00-36.00	**p=0.003**
Day and night shifts	97 (39.3)	15.81±13.44	0.00-59.00	
24 hour shift	117 (47.4)	23.36±17.46	0.00-63.00	
Working hours per week^{Z}				
≤45 hours	92 (37.2)	16.63±14.07	0.00-63.00	p=0.06
≥46 hours	155 (62.8)	20.79±16.39	0.00-61.00	
Fear of infection with the COVID-19 virus^{Z}				
Yes	213 (86.2)	20.63±15.90	0.00-63.00	**p<0.001**
No	34 (13.8)	10.50±10.66	0.00-40.00	
Fear of infecting their family with the COVID-19 virus^{Z}				
Yes	238 (96.4)	19.72±15.65	0.00-63.00	**p=0.003**
No	9 (3.6)	6.44±9.86	0.00-31.00	
The state of thinking that he/she should get psychological support during this period^{Z}				
Yes	138 (55.9)	25.79±15.64	1.00-63.00	**p<0.001**
No	109 (44.1)	10.94±11.16	0.00-45.00	
The state of thinking that he/she has adequate personal protective equipment while working^{Z}				
Yes	177 (71.7)	16.27±13.97	0.00-61.00	**p<0.001**
No	70 (28.3)	26.75±17.24	0.00-63.00	
Those with children (n=109, 44.1%); having problem/problems with their children's care in the last weeks^{Z}				
Yes	61 (55.9)	24.81±14.54	0.00-59.00	**p<0.001**
No	48 (44.1)	9.72±11.11	0.00-42.00	
Those with children (n=109, 44.1%); Thinking that working conditions in the last weeks negatively affect their children^{Z}				
Yes	83 (76.1)	22.00±15.08	0.00-63.00	**p<0.001**
No	26 (23.9)	5.96±5.84	0.00-22.00	

^{Z}: Mann-Whitney U test, $^{\chi^2}$: Kruskal-Wallis H test, SD: Standard deviation, COVID-19: Coronavirus disease-2019

Similarly, during the pandemic a positive relationship can be seen between the increase in the working hours of medical personnel (4), working night shifts (5), an increase in workload (21) and poor sleep quality. This result shows the importance, where possible, of offering staff shorter shifts, limiting their working hours and ensuring that weekly working hours do not exceed 45 hours.

The study determined that the sleep quality of medical personnel who stated that they were afraid of catching COVID-19, who thought that they needed psychological support, and who did not have sufficient personal protective equipment, was worse than others. One study (5), stated that medical personnel who believed that their personal protective equipment was insufficient had poor sleep quality. Another study (29) reported that healthcare professionals treating infected patients during the COVID-19 pandemic had aggravated anxiety and sleep quality and needed more psychological support. Xiao et al. (1) stated that providing social support during the COVID-19 pandemic not only reduces anxiety symptoms, but also indirectly improves sleep quality. In the literature, another study comparing individuals's with the thought of the need for psychological support and sleep quality could not be found. These results are substantial in terms of showing that when adequate protective equipment and thenecessary psychological support is provided to medical personnel during the pandemic, then their sleep quality will subsequently improve.

It was found that the sleep quality of personnel who had problems related to caring for their children in the previous weeks, and who thought that their working conditions negatively affected their children was worse than others. No other study comparing these characteristics and sleep quality could not have been found in the literature. During the pandemic, the workload of medical personnel has increased. At the same time, medical personnel have experienced social stigmatization as possible carriers of infection. During the pandemic, personnel in the health care sector may have experienced difficulties in caring for their children due to childcare centers, nurseries, kindergartens and schools being closed, or limited in when they can open, and may also have problems finding babysitters (30). In the face of all these negative events, it is to be expected that medical personnel would experience physical and psychological problems and that their sleep quality would be disturbed.

Comparison of the Participants' Characteristics and Beck Anxiety Scores

In the study, it was determined that female participants experienced more anxiety. Some of the relevants studies found that female healthcare personnel experience more anxiety during the pandemic (31-36) while other relevants found no relationship between gender and anxiety levels (4,9,12,21,37). In conclusion, it can be suggested that the pandemic affects women more psychologically in general.

The study determined that the anxiety levels of the participants who stated that they had a diagnosis of psychological illness were higher than those of individuals who did not. Similar results have also been found in other studies (21,38). It is important that medical personnel with psychological illnesses be better supported during the pandemic.

It was found that smokers and alcohol drinkers had higher levels of anxiety than those who did not drink or smoke. The increase in the use of cigarettes and alcohol by the participants during the pandemic period was not looked at in the study. This result is similar to the result of Tran et al.'s (39) study. Sallie et al. (40) stated that individuals whose alcohol drinking increased during the pandemic period had higher anxiety levels than other individuals. This shows the importance of monitoring anxiety in medical personnel who smoke cigarettes and drink alcohol.

The study determined that the anxiety levels of medical personnel working in adult + pediatric emergency clinics were higher than those working in adult emergency or pediatric emergency clinics. In the literature review (32,33,35,37), no difference was found between the units where the medical personnel were working during the pandemic and their anxiety levels. The current study is considered that the anxiety of medical personnel increased due to having to provide simultaneous treatment and care to both adults and children, who are very different from each other in terms of their characteristics and needs.

No significant difference was found between the weekly working hours of the participants and their anxiety levels; however, it was found that the anxiety of the participants with more working 24 hours was higher (30). It has been stated in the literature that there is a positive correlation between increase in workload of medical personnel during the pandemic period (12,21), working night shifts (5), an increasein weekly working hours (41) and increased levels of anxiety. Working longer hours increases the time spent with the patient and medical personnel have to wear personal protective equipment for long periods of time (10). Spending more time in thehospital can lead to medical personnel becoming both physically and psychologically exhausted (28). It is thus important that 24-hour shifts and having to be continuously on call be limited as far as possible.

The study found that the anxiety levels of medical personnel who stated that they were afraid of being infected with COVID-19 and of infecting their family with COVID-19, who believed they needed psychological support, and who did not have sufficient protective equipment, were higher than those of other participants. It has been determined that those individuals and medical personnel who think most about COVID-19 experience greater anxiety (6,21,31,42,43). Focusing on the illness over a long period of time increases anxiety. Being with people who are COVID-19 positive can lead to various mental problems (8,9,35). Bai et al. (5) determined that personnel diagnosed with COVID-19 had insufficient personal protective equipment and this situation increases their anxiety. In a study conducted in Turkey, it was observed that there was no difference between access to personal protective equipment and the anxiety scores of nurses working in pandemic hospitals (33). This was because almost all of the participants (98%) stated that they had

access to protective equipment (33). It can be said that having access to personal protective equipment during the pandemic affects anxiety greatly. In addition, the vast majority of medical personnel are afraid of infecting their family with COVID-19 and so experience more anxiety (12,29,31,33,35,36,41). During this difficult and tiring period, the fact that medical personnel have to continue to work while also fulfilling all their normal responsibilities at home is another factor that increases anxiety.

The study determined that personnel who had had problems with the care of their children in the previous weeks, and who believed that their working conditions affected their children negatively, had higher anxiety levels than other participants. Due to the increased workload in hospitals during the pandemic, the ways in which medical personnel work have changed, and, as a result, they have not been able to devote time to their families and children. On top of all these negative conditions, the closure of nurseries, kindergartens, and schools for extended periods of time has increased problems regarding the care of their children (30). The fact that babysitters do not want to take care of the children of health care personnel, in order to prevent themselves from becoming infected, may cause anxiety and leave medical professional feeling helpless.

Relationship Between PSQI and Beck Anxiety Scores

The average PSQI score of the participants in the study was found to be 14.39±3.13. All of the participants (n=247, 100%) had a PSQI score greater than 5; that is, their sleep quality was poor. In the studies conducted before the pandemic period (20,44-47), it was stated that sleep quality was poor in more than half of the healthcare personnel. Studies conducted during the pandemic have found that the mean PSQI score of medical personnel working in clinics ranged from 5.1±3.8 to 9.3±3.8 (1,4,12,37,48-50). The mean PSQI score of medical personnel working in COVID-19 units has been stated to vary between 8.3±4.5 and 16.0±3.7, while the score of those not working in COVID-19 units varies between 5.2±3.7 and 4±3.13 (4,29,50,51). As a result of the current study, the PSQI scores of the participants were found to be higher than in all other studies. This can be explained by the fact that the first place where individuals with severe COVID-19 symptoms are brought is usually the emergency clinic, that very fast and systematic care is usually required, and that this situation causes stress and severely disrupts the sleep quality of personnel. The increase in the workload of the emergency room personnel may be another reason for their diminished sleep quality.

The average Beck anxiety score of the participants was found to be 19.24±15.67. 21.9% of the medical personnel had mild anxiety, 15.8% of them had moderate anxiety, and 33.2% of them had high anxiety. In other recent studies conducted during the pandemic, the average Beck anxiety score of medical personnel working in clinics ranges from 7.7±8.7 to 16.5±13.6 (12,48,52). Studies have shown that, of medical personnel working in pandemic clinics, between 23.9% and 38.0%have mild anxiety, between 17.3% and 20.0% have moderate anxiety, and between 13.0% and 27.2% have high anxiety (12,52). In a study conducted in Şanlıurfa it was found that 53.7% of emergency room personnel had mild, 28.4% moderate, and 17.9% severe anxiety (31). In line with these results, it can be said that medical personnel working in emergency departments during the pandemic have a higher rate of moderate and severe anxiety than those working in clinical services. This may be due to the high risk in emergency clinics of direct contact with COVID-19 patients who have not yet been diagnosed.

Similar to this study, a number of studies have found a positive significant relationship between anxiety and sleep quality (1,4,5,49). This result is significant as it shows that attempts to reduce medical personnel's anxiety levels will also improve their sleep quality.

Study Limitations

The study has some limitations. Although the researchers sent the questionnaires to all emergency services in Turkey, only volunteer participants filled out questionnaires. Individuals with deteriorated anxiety and sleep quality may have been more willing to fill out the questionnaires.

It is not possible to suggest a definite causal relationship between some characteristics of healthcare professionals and their anxiety and sleep quality levels during the COVID-19 pandemic since this is a cross-sectional study. The absence of a control group makes it difficult to determine whether the factors triggering anxiety and sleep disorders in the general population have triggered anxiety and sleep disturbance in healthcare staff during the pandemic.

The researchers did not know the anxiety and sleep quality levels of the participants in the pre-pandemic period. It is also impossible to review all the rapidly growing literature on the subject as the number of studies on the COVID-19 pandemic and the status of healthcare workers during this pandemic is increasing day by day.

Conclusion

Comparison of the Participants' Characteristics and PSQI Scores

Personnel working 24-hour shifts, whose working in pediatric emergency clinics, whose working hours were more than 45 hours per week, who did not have adequate protective equipment, who are experiencing problems with the care of their children, who believe that their working conditions affect their children negatively, and who fear that they will become infected with COVID-19, who thought that they needed psychological support (Table 4), who smoke and/or drink alcohol, who have a psychological illness (Table 2), are the most at-risk groups for poor sleep quality.

Comparison of the Participants' Characteristics and Beck Anxiety Scores

Personnel working 24-hour shifts, whose working in adult + pediatric emergency clinics, who did not have adequate protective equipment, who are experiencing problems with the care of their children, who believe that their working conditions

affect their children negatively, and who fear that they or their family will become infected with COVID-19, who thought that they needed psychological support (Table 5), who are female, who smoke and/or drink alcohol, who have a psychological illness (Table 3), are the most at-risk groups for anxiety.

During the pandemic, the anxiety levels of medical personnel working in the emergency services have been high and their sleep quality has been poor. The results of this research show the importance of more closely monitoring the psychological health of the medical personnel whose working especially with pediatric patients in emergency clinics, who are experiencing problems with the care of their children, who believe that their working conditions affect their children negatively, and who have other risks (negative working conditions, smoking and/or alcohol use, etc.), and providing them with the necessary support.

Relationship Between PSQI and Beck Anxiety Scores

The study found that as the anxiety levels of medical personnel increased, so their sleep quality also deteriorated. It is recommended that the anxiety and sleep quality of medical personnel be determined and monitored, and that the necessary psychological support be provided.

Acknowledgments: We thank all the medical staff who participated in our study.

Ethics

Ethics Committee Approval: Before beginning the research, the necessary permission was obtained from the Ministry of Health (dated 11.06.20: and numbered: 2020-06-06T11_00_45), as well as from the ethics committee permission (dated: 14.08.2020 and numbered: E-25403353-050.99-77351).

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Fizik Tedavi ve Rehabilitasyon Kliniğinde Yatan Kadın Hastalarda Uyku Sorunları

Sleep Problems of Hospitalized Women in Physical Therapy and Rehabilitation Clinic

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Öz

Amaç: Bu araştırma, fizik tedavi ve rehabilitasyon kliniğinde yatmakta olan menopozal dönemdeki kadınların uyku sorunlarının belirlenmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırmanın türü tanımlayıcı olup Konya ilinde bir üniversite hastanesinin fizik tedavi ve rehabilitasyon servisinde en az iki gündür yatmakta olan, 45-60 yaş arası, hormon replasman tedavisi kullanmayan, cerrahi menopoza girmeyen, sedatif ilaç almayan ve koopere olan, çalışmaya katılmayı kabul eden 169 kadınla yapılmıştır.

Bulgular: Hastaların yaş ortalaması 54,6±4,5 idi. Uyku düzenini etkileyen etmenler formu puan ortalaması 81,5±12,72 olarak sonuçlandı. Hastanede kalma süresi, stresli yaşam, psikiyatrik hastalık öyküsü, gündüzleri uyuma ile uyku düzenini etkileyen etmenler ölçek puanı arasında istatistiksel anlamlı fark saptandı ($p<0,05$). Kadınların çalışma durumu, gelir düzeyi, aile tipi, yaşadığı yer, sigara kullanımı, kahve tüketimi, çay kullanımı, düzenli egzersiz yapma, sürekli kullanılan ilaç, son dört hafta içinde sağlık sorunu yaşama ile uyku düzenini etkileyen etmenler ölçek puanı arasında istatistiksel anlamlı fark olmadığı saptandı ($p>0,05$).

Sonuç: Araştırma sonucunda, hastaların yarıdan fazlasının hastaneye yattıktan sonra uyku alışkanlığında değişiklik olduğu, geceleri aynı saatte uyumadığı, gürültü, ağrı, vücuda takılı tıbbi cihazların, uyku düzenlerini etkilediği belirlendi.

Anahtar Kelimeler: Hastane, hasta, uyku, menopoz, uykuyu etkileyen etmenler

Abstract

Objective: This study was conducted to determine the sleep problems of hospitalized women in the physical therapy and rehabilitation department.

Materials and Methods: This is a descriptive study carried out among 169 women from 45-60 age groups, who were hospitalized in the physical therapy and rehabilitation clinic of a university hospital in Konya for at least 2 days, did not use a hormone replacement therapy, did not undergo a surgical menopause, did not use a sedative drug, cooperated, and consented to be included in the study.

Results: The mean age of the patients 54.6±4.5 years. The mean score of the factors affecting the sleep pattern form was 81.5±12.72. It was found that there was a difference between the scale score of the factors affecting the duration of the hospitalization, having stress, history of psychiatric illness, daytime sleep and sleep patterns ($p<0.05$). It was revealed that there was no difference between the scale score of a working status of the women, income level, family type, place of residence, smoking, coffee consumption, tea drinking, regular exercise, permanently used medicine, medication, having a health problem in the last four weeks, and factors affecting the sleep patterns ($p>0.05$).

Conclusion: As a result of the study, it was determined that more than half of the women had a change in their sleeping habits after they were hospitalized, and did not sleep at the same time at night; noise, pain, and medical devices attached to the body affected their sleep patterns.

Keywords: Hospital, patient, sleep, menopause, factors affecting sleep

Giriş

Uyku; birçok fizyolojik sistemi etkileyen nörobiyolojik düzenlemeler altında ortaya çıkan vücudun dinlenmesini sağlayan, bireyin yaşam kalitesini artıran, sağlıklı yaşam için vazgeçilmez bir gereksinimdir (1-3). Bireylerin ihtiyaç duydukları uyku süresi; yaş, cinsiyet, beslenme, aktivite düzeyi, sağlık, çevresel faktörler ve bireysel özelliklere göre farklılık göstererek kişiden kişiye değişmektedir (4). Erişkin kişilerde uyku süresi ortalama 7-9 saattir (5). Uyku düzeninin normalden saptığı durumlarda uyku sorunları görülmekte ve bu oran erişkin yaş grubunda yaşla birlikte artmaktadır (6).

Uyku sorunu, bireylerin yaşam kalitelerini etkileyen, tek başına bir sağlık sorunu olduğu gibi başka hastalıklarla birlikte de görülebilen, ciddi komplikasyonlara yol açabilen önemli bir sağlık problemidir (7). Uyku sorunlarıyla hastaneye yatma ve hasta olma

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durumunda karşılaşılmaktadır (8). Çünkü hastaneye yatış, ilaçlar, aktif tıbbi problemler, gündüz yapılacak aktivitenin azalması, gürültü; uyku düzeninin bozulmasına sebep olmaktadır (9). Birey, stresle baş etmeye çalışırken, bir taraftan da uyku gereksinimini karşılamaya çalışacaktır ve uyku daha fazla önem kazanacaktır (8). Yapılan bir çalışmada hastaneye yatış, hastalık süreci ve hastanede kalınan gün sayısının uyku kalitesini olumsuz yönde etkilediği saptanmıştır (10). Hastanede yatan hastalarda uyku kalitesi ile ilgili yapılan bir çalışmada ise hastaların uyku düzenlerinin, sıklıkla ağrıdan, odanın fazla ışıklı olmasından, odanın ısısından ve havasız olmasından etkilendiği bildirilmiştir (11).

Hastanelerde uyku kalitesini artırmak için yapılan müdahaleler, son yirmi yılda artış olup çoğu farmakolojik müdahaleye odaklanmıştır (12). Farmakolojik yöntemler ise olumsuz yan etkileri nedeniyle kontrendike olabilmektedir (13). Örneğin hipnotik ilaçlar deliryum, düşme ve kırıkları artırabilme riskine karşı yaşlı erişkinlerde kaçınılmakta, hastanede yatan hastalarda farmakolojik olmayan müdahaleler (akupunktur, aromaterapi, nefes alma egzersizleri, rahatlatıcı müzik videoları vb.) en uygun birinci basamak tedavi yöntemi olarak kabul edilmektedir (12). Yoğun bakım ünitesindeki bilinçli hastalarda uyku kalitesini artırmak için yapılan bir çalışmada, deney grubuna çevresel uyaranların azaltılması (gürültü, ışık, sıcaklık vb.), rejim üzerine eğitim verilmesi (yatmadan önce kafein sigara gibi uyaranların azaltılması, yemek yenmemesi vb.), gündüz uykunun kısıtlanması, uykuyu baskılayan ilaçların azaltılması gibi birçok farmakolojik olmayan tedavi yöntemi uygulanmış olup, araştırma sonucunda sübjektif değerlendirmeler olumlu sonuç vermiştir ve klinik pratikte uygulanması değerli olabileceği sonucuna varılmıştır (14).

Yurt dışında genel popülasyonda yapılan bir çalışmada ise kadınların erkeklerden daha yüksek düzeyde uyku sorunlarına sahip olduğu saptanmıştır (15). Kadın yaşamı boyunca birçok dönemden geçmekte ve bu dönemlerden biri olan menopozda kadınların uyku sorunlarını artırmamaktadır (16). Menopoz, vazomotor semptomların başlaması ile karakterize olup, genellikle ruh hali, beden imajı ve uyku düzeninde değişikliklerle seyreder. Yapılan bir kadın sağlığı çalışmasında uyku bozukluğu prevelansı premenopozal yaş grubundaki kadınlarda %16-42, menopozal kadınlarda %39-47 ve menopoz sonrası kadınlar %35-60 arasında değişmektedir (17). Menopoz döneminde görülen uyku bozuklukları; yaşa bağlı fizyolojik değişiklikler, kronik sağlık sorunları, stres ve menopozla ilişkili semptomlar olmak üzere çeşitli faktörlerle ilişkilendirilmiştir (18). Bu araştırma, fizik tedavi ve rehabilitasyon biriminde yatmakta olan kadın hastaların uyku sorunlarını belirlemek amacıyla yapılmıştır.

Gereç ve Yöntemler

Araştırmanın Amacı ve Tipi

Araştırma, fizik tedavi ve rehabilitasyon biriminde yatmakta olan kadın hastaların uyku sorunlarını belirlemek amacıyla tanımlayıcı nitelikte yapılmıştır.

Araştırmanın Yapıldığı Yer ve Zaman

Araştırma bir üniversite hastanesinde fizik tedavi ve rehabilitasyon servisinde 22 Temmuz-10 Eylül 2019 tarihleri arasında en az iki gündür yatmakta olan kadınlara uygulanmıştır.

Araştırmanın Evren ve Örneklemi

Araştırmanın evrenini, belirtilen tarihler arasında hastanenin fizik tedavi ve rehabilitasyon servisindeki tüm kadınlar oluşturmuştur. Örneklem büyüklüğünün hesaplanmasında; Özkaya ve ark.'nın (8) yapmış oldukları çalışmada bulunan uyku düzenini etkileyen etmenler formunun standart sapma değerinden [Standart sapma (SS)=13,24] ve evrenin bilinmediği durumlarda $n=t^2.\sigma^2 d^2(19)$ formülünden yararlanılarak hesaplanmıştır. Formülde % 95 güven düzeyi ve sapma d=2 kabul edilerek $n=(1,96)^2x(13,24)^2/(2)^2=168,25$ olarak bulunmuştur. Örnekleme 169 kadın alınmıştır. Katılımcıların örnekleme dahil edilme kriteleri; serviste az iki gündür yatmakta olan, 45-60 yaş grubunda, hormon replesman tedavisi kullanmayan, cerrahi menopoza girmeyen, sedatif ilaç almayan ve koopere olan, çalışmaya katılmayı kabul eden 169 kadınla yapılmıştır. Araştırmaya katılmayı kabul etmeyen, yer, zaman, oryantasyonu sorunu bulunan, uyku düzeni üzerinde doğrudan etkili ek hastalıkları olan (demans, alkol alışkanlığı vb.) araştırmadan dışlanmıştır.

Veri Toplama Araçları

Kişisel Bilgi Formu

Katılımcıların sosyo-demografik özelliklerini, hastalık özellikleri (kronik hastalık, psikiyatrik hastalık, sürekli kullanılan ilaç vb.) ve uyku özelliklerini (uyku alışkanlığında değişiklik durumu, hastaneye yatmadan önce uyku problemi olma durumu vb.) içeren 19 sorudan oluşmaktadır.

Uyku Düzenini Etkileyen Etmenler Formu (UDEEF)

UDEEF uyku kalitesini nitelik ve nicelik açısından değerlendirmeyi amaçlamaktadır. Geçerlik ve güvenirliği Tosunoğlu (20) tarafından yapılan UDEEF 24 soru içeren likert tipi bir ölçektir. Uyku sorunları 5 seçenekli bir dizide derecelendirilerek hastalara sorulmuştur: 1=Hiç etkilemiyor, 2=Etkilemiyor, 3=Kararsızım, 4=Etkiliyor, 5=Çok etkiliyor olarak sıralanmıştır. Bu ölçekten alınabilecek en yüksek puan 120 ve en düşük puan 24 olarak belirlenmiş olup, ankette puan artışı ile uyku kalitesi ters orantılı olarak etkileşim göstermektedir. UDEEF'de hastanın uykusunu etkileyen etmenler; yatak, ışık, ısı, gürültü gibi çevresel etmenler, hastalığı hakkında yeterli bilgi verilip verilmemesi, kaygı düzeyi gibi psikolojik etmenler ele alınmıştır.

Verilerin Toplanması

Veriler; çalışmanın yapıldığı kurumdan yazılı izin alındıktan sonra katılımcılardan da sözel izin alınarak yüz yüze görüşme tekniği kullanılarak toplanmıştır.

İstatistiksel Analiz

Araştırmada, anket formlarından elde edilen veriler ''Stastical Pack age for Social Science for Windows (SPSS 25)'' paket programı kullanılarak oluşturulan veri tabanına kaydedilmiş ve bu program ile verilerin analizi yapılmıştır. Veri gruplarının dağılımları incelenerek grupların ortalamaları, standart sapmaları, çeyrek değer genişlikleri, normal dağılıma uyup uymadıkları ve histogramları elde edilmiştir. Ölçme ile elde edilmiş verilere sahip bağımsız grupların karşılaştırmasında; parametrik test verilerinin sağlanması durumunda Student's t-testi ve varyans

analizi, sağlanmaması durumunda Mann-Whitney U testi ve Kruskal-Wallis varyans analizi kullanılmıştır. Ayrıca, iki ya da daha fazla değişken arasında ilişki olup olmadığının tespiti için korelasyon ve regresyon analizi uygulanmıştır. Sonuçlar %95 güven aralığında değerlendirilerek p<0,05 değeri istatistiksel olarak anlamlı kabul edilmiştir.

Araştırmanın etik yönü: Araştırmaya başlamadan önce Necmettin Erbakan Üniversitesi Etik Kurulu (05.07.2019 tarih, 14567952-050/1164 sayılı) ve Necmettin Erbakan Üniversitesi Meram Tıp Fakültesi Hastanesi Başhekimliği'nden (22.07.2019 tarih, 14567952-900-1264 sayılı) gerekli izinler alınmış; ve araştırmaya katılmaya gönüllü olan katılımcılara araştırma hakkında bilgi verilerek sözlü onamları alınmıştır. Araştırmada Helsinki Deklarasyonu Prensipleri'ne uygun davranılmıştır.

Araştırmanın sınırlılıkları: Araştırmanın tek merkezli olarak yürütülmesi araştırmanın sınırlılıklarındandır.

Bulgular

Çalışmaya toplam 169 kadın alındı. Hastaları tanıtıcı özellikleri incelendiğinde; yaş ortalaması 54,6±4,5 (min=45, maks=60), hastaların %44,4'ünün okur-yazar/ilkokul mezunu, %88,2'sinin çalışmadığı, %65,1'inin çekirdek aile tipine sahip olduğu, %82,2'sinin ilde yaşadığı, %69,8'inin evli olduğu, %91,7'sinin sigara kullanmadığı, %91,1'inin çay tüketimi yaptığı, %55,6'sının kahve tüketmediği, %54,4'ünün stres yaşadığı, %78,1'inin düzenli egzersiz yapmadığı belirlenmiştir.

Yapılan analizlerde hastaların stres yaşaması, düzenli egzersiz yapması ile uyku düzenini etkileyen etmenler ölçek puan ortalaması arasında fark olduğu (p<0,05), kadınların eğitim durumu, çalışma durumu, gelir durumu, aile tipi, yaşadığı yer, medeni durum, sigara kullanma, çay tüketimi, kahve tüketimi ile uyku düzenini etkileyen etmenler ölçek puan ortalaması arasında fark olmadığı saptanmıştır (p>0,05).

Hastaların %65,1'inin hastaneye yattıktan sonra uyku alışkanlığında değişiklik olduğu, %74'ünün geceleri aynı saatte uyuyamadığı, %75,1'inin gürültüden etkilendiği, %69,8'inin hastaneye yatmadan önce uyku problemi yaşamadığı, uyku sorunu yaşayan hastaların ise %74,6'sının uyku sorununu gidermek için bir şey yapmadığı belirlenmiştir. Hastaneye yattıktan sonra uyku alışkanlığında değişiklik durumu, gündüzleri uyuyabilme, geceleri aynı saatte uyuyabilme, gürültü, hastaneye yatmadan önce uyku problemi olma durumu, uyku sorununu gidermek için yapılan girişimlerden; ılık bir duş, bitki çayı, TV seyretme, ilaç alma, sessiz/loş odaya geçme ile Uyku düzenini etkileyen etmenler ölçek puan ortalaması arasında fark olduğu saptanmıştır (p<0,05) (Tablo 1).

Araştırma kapsamın alınan hastaların uyku düzenini etkileyen etmenler formundan alabilecekleri en düşük 24, en yüksek 120 puan olup, hastaların uyku düzenini etkileyen etmenler formundan ortalama 81,5±12,7 (min=47, maks=107) puan aldıkları belirlenmiştir.

Araştırmaya katılan hastaların menopoz öyküleri incelendiğinde; ortalama 7,8±4,8 (min=1, maks=27) yıldır adet görmediği, %7,7'sinin son bir ya da iki yıldır adetlerim düzensiz olduğu, %37,3'ünün adetten kesilmeden önce bir ya da iki yıl adetlerinin düzensiz ve son bir yıldır hiç adet görmediği, %55,5'inin bir yıldan fazla süredir adet görmediği belirlenmiştir. Hastaların menopoz öyküsü ile uyku düzenini etkileyen etmenler formu ölçek puan ortalaması arasında fark olmadığı saptanmıştır (p>0,05) (Tablo 2).

Tartışma

Araştırma kapsamına alınan hastaların eğitim, çalışma, gelir, medeni durum ve yaşadığı yer gibi bireysel özelliklerinin UDEEF puan ortalamasını istatistiksel olarak anlamlı etkilemediği saptanmıştır. Özkaya ve ark. (8) çalışmasında, hastaların tanıtıcı özelliklerine göre uyku puan ortalamaları incelendiğinde medeni durum, öğrenim durumu, kronik hastalık durumunu anlamlı etkilemediği saptanmıştır. Aynı çalışmada erkeklerin UDEEF puan ortalaması kadınlardan daha yüksek olmakla birlikte anlamlı bir farklılık bulunamamıştır. Wesselius ve ark. (21) hastanede yatan hastalarda uykunun kalitesi ve uyku sorunlarıyla ilgili yaptığı çalışmada da cinsiyet, yaş vb. tanıtıcı özelliklerin uyku sorununu etkilemediği saptanmıştır. Atar ve ark. (10) çalışmasında da hastaların cinsiyet, yaş, medeni, eğitim, çalışma ve gelir durumu, sosyal güvencesi gibi bireysel özelliklerle UDEEF puan ortalamaları arasında anlamlı olarak etkilenmediği saptanmıştır. Bu bulgular tanıtıcı ve bireysel özelliklerin UDEEF puan ortalamasını anlamlı olarak etkilemediği nedeniyle yapılmış diğer çalışmalarla benzerlik göstermektedir.

Araştırma kapsamına alınan hastaların %65,1 gibi büyük bir çoğunluğunun hastaneye yattıktan sonra uyku alışkanlığında değişiklik olduğunu ifade etmişlerdir. Hastaların uyku alışkanlığındaki değişikliklere bakıldığında; hastaneye yattıktan sonra hastaların %85,1'i geceleri aynı saatte uyuyamadıkları, %85,3'ünün gürültüden uykularının etkilendikleri, %78,3'ünün hastaneye yatmadan önce uyku probleminin olmadığı belirtilmiştir. Atar ve ark. da (10) hastaların %66,4'ünde hastaneye yattıktan sonra uyku sorunu geliştiğini tespit etmiş, hastaneye yatma ve hastalık deneyiminin uyku düzeninde olumsuz etkilere sahip olduğu belirlenmiştir. 2017 yılında yurt dışında 39 hastanede yapılan bir çalışmada hastanede yatan hastaların uyku süresinin ve kalitesinin önemli ölçüde etkilendiği, hastane de toplam uyku süresinin 83 dakika azaldığı, hastane de evde uyandığından üç kez daha fazla uyandığı belirlenmiştir (21). Elde edilen bulgular hastaneye yatma deneyiminin uykuyu olumsuz etkilediği yönünden yapılmış diğer çalışmalarla benzerlik göstermekte olup, uykunun sağlıklı ve düzenli bir şekilde devam ettirilebilmesi için fizyolojik, psikolojik etmenlerden etkilendiği ve gerekli koşulların sağlanması gerektiğini düşündürmektedir.

Hastanede yatan hastalarda uyku sorununa sebep olacak birçok faktörden bahsedilmektedir; çevresel gürültü (monitör alarmları, ekipman sesleri, sağlık personeli ve diğer hastalar tarafından yapılan konuşmalar), altta yatan akut hastalık, ağrı, anksiyete, depresyon, deliryum, ilaç (22). Fizik tedavi ve rehabilitasyonda yatan hastaların tanılarının en önemli semptomlarından birinin ağrı olduğu ve hastaların %96,5'inin ağrıdan dolayı uyku sorunu yaşadığı belirlenmiştir. Ağrı bireyin günlük yaşam aktivitelerini uygulamasını zorlaştırabilecek, komplikasyonlara yol açabilecek önemli bir etken olup; tek başına uykuyu etkileyebilecek bir faktördür (8). Aksu ve Erdoğan (11) akciğer rezeksiyonu yapılan

hastaların cerrahi sonrası uyku sorunu yaşadıkları ve ağrının önemli bir faktör olduğu saptanmıştır. Sonuçlar, hastaların uyku sorunu yaşamalarındaki en önemli faktörlerden birinin ağrı olarak saptanmasıyla yapılan diğer çalışmalarla benzerlik göstermekte olup, ağrı; son zamanlarda beşinci yaşam bulgusu olarak görülmekte ve etkili bir ağrı kontrolünün yapılmasının önemini ortaya çıkarmaktadır.

Çalışmamızda, hastaların uyku düzenini en fazla etkileyen etkenler, ağrı, hastalıkla ilgili kaygılar, yatağın ve yastığın rahatsız edici olması, yatak takımlarının kirli ve düzensiz olması, vücuda takılı tıbbi cihazlar, odaya sık sık girilip çıkılması, çevredeki gürültüler olarak belirlenmiştir. 2019 yılında hastaların uykusunu etkileyen belirleyici faktörleri saptamak amacıyla yapılan bir çalışmada tıbbi durum, hastaneye yatış, prosedürler hakkında endişelenme uyku sorunlarının %21'ini, gece yapılan bakımlar, ağrı %18,1'ini, çevre, personelin konuşması, alarmlar %17,3'ünü oluşturduğu tespit edilmiştir (23). Yapılan çok merkezli bir çalışmada uykuyu etkileyen faktörlerin %65,8'i hastaneyle ilgili olup, %22,6'sı diğer hastaların gürültüsü, %20,1'inin sağlık personeli tarafından yapılan sesler, uyandırılma, %21,6'sının sık

Tablo 1. Hastaların uyku özellikleri ve UDEEF'den aldıkları puan ortalamalarının dağılımı (n=169)

Hastaların uyku özelikleri	Evet n ($\bar{x}$ ± SS)	Hayır n ($\bar{x}$ ± SS)	Test ve p
Hastaneye yattıktan sonra uyku alışkanlığında değişiklik durumu	110 (88±7,8)	59 (69,6±11,4)	Z=-8,209 p=0,000
Gündüzleri uyuyabilme durumu	125 (79,5±13,1)	44 (87,3±9,5)	Z=-3,406 p=0,001
Geceleri aynı saatte uyuyabilme durumu	44 (71,5±13,5)	125 (85,1±10,4)	Z=-5,503 p=0,000
Hastanedeki gürültünün uykuyu etkileyebilme durumu	127 (85,3±10,7)	42 (70,1±11,6)	Z=-6,189 p=0,000
Hastaneye yatmadan önce uyku problemi olma durumu	51 (89,2±7,6)	118 (78,3±13,1)	Z=-5,264 p=0,000
Uyku sorununun gidermek için bir şey yapma durumu	43 (89,2±7)	126 (78,9±13,2)	Z=-4,544 p=0,000
Uykusuzluk yaşandığında uyumak için yapılanlar			
Ilık bir duş	21 (89,3±7,3)	148 (80,4±13)	Z=-3,074 p=0,002
Bitki çayı	28 (89,2±7,1)	141 (80±131)	Z=-3,512 p=0,000
Rahat ve terlemeyen kıyafet	13 (87,5±6,7)	156 (81±13)	Z=-1,384 p=0,116
Kitap okuma	4 (89,5±5,8)	165 (81,4±12,8)	Z=-1,040 p=0,298
TV seyretme	17 (89,2±8,3)	152 (80,7±12,9)	Z=-2,686 p=0,007
İlaç alma	23 (89,7±6,9)	146 (80,3±13)	Z=-3,324 p=0,001
Müzik dinleme	3 (89,3±5,1)	166 (81,4±12,8)	Z=-0,989 p=0,323
Sessiz/loş odaya geçme	18 (90,4±4,3)	151 (80,5±13)	Z=-3,034 p=0,002
Ilık ya da serin odaya geçme	7 (90,7±4,8)	162 (81,1±12,8)	Z=-1,907 p=0,057

Z: Mann-Whitney U testi, SS: Standart sapma, UDEEF: Uyku düzenini etkileyen etmenler formu

Tablo 2. Menopoz öyküsü ile UDEEF'den aldıkları puan ortalamalarının dağılımı

Özellikler	n (%)	$\bar{x}$ ± SS	Test ve p
Son bir ya da iki yıldır adetlerim düzensiz	13 (7,7)	82,7±14,8	Z=0,101 p=0,951
Adetten kesilmeden önce bir ya da iki yıl adetlerim düzensizdi ve son bir yıldır hiç adet görmedim	63 (37,3)	81,5±12,7	
Bir yıldan fazla süredir adet görmüyorum	93 (55,5)	81,4±12,6	

K: Kruskal-Wallis testi, SS: Standart sapma, UDEEF: Uyku düzenini etkileyen etmenler formu

tuvalete çıkma olarak tespit edilmiştir (21). Yılmaz ve ark'nın (24), Önler ve Yılmaz (25) ve Atar ve ark.'nın (10) yaptıkları çalışmada da en çok ağrı, gürültüler, odanın havasız olması, kalabalık olması, yatak takımlarının kirli ve düzensiz olması etmenlerinden uykusuz kaldıkları belirlenmiş olup çalışmadan elde edilen bulgular diğer çalışmalarla benzerlik göstermektedir. Çalışmamız da yaş grubu ağırlıklı olarak menopozal dönemdeki kadınları içerdiği için menopoz öyküsü ile UDEEF ölçek puan ortalaması arasındaki ilişkiye bakılmış, fark olmadığı saptanmıştır. Menopoz uykuya dalmada zorluk, gündüzleri uykulu olma sıklığında artış, uyku verimliliğinde azalma gibi riskleri artırmakla birlikte menopozun uyku sorunlarıyla ilişkisi olmadığı da bildirilmektedir (26).

Alınabilecek en düşük puanın 24, en yüksek puanın ise 120 olduğu UDEEF'den hastaların ortalama 81,5 (SS=12,7) puan aldıkları saptanmıştır. Atar ve ark. (10) bir üniversite hastanesinin cerrahi kliniğinde yatan hastaların UDEEF puan toplam ortalamasını 80,59 (SS=16,75), Özkaya ve ark. (8) ameliyat sonrası erken dönemde hastaların UDEFF puan ortalamasını 57,35 (SS=13,24) olarak bulmuştur. Bu sonuçlar hastaneye yatan hastaların uyku durumunu kötü yönde etkileyen faktörlerin fazla olduğunu düşündürebilir. Bu nedenle, hemşireler hastaneye yatan hastaların uyku düzenini ve kalitesini etkileyebilecek faktörleri değerlendirmeli, bu faktörler belirlendikten sonra bireyin yaşam kalitesini artırmaya yönelik bakım ve eğitimler yapılmalı, bilgi eksikliği ile ilgili endişeler giderilmelidir.

Sonuç

Uyku, fiziksel ve ruhsal olarak bedenin dinlendiği, sorumluluk ve stresten uzaklaştığı, iyileşmenin sağlandığı, birçok faktörden etkilenebilen temel yaşam aktivitelerinden biridir. Hasta olma ve hastaneye yatma uyku düzenini etkileyebilmektedir. Araştırma sonucunda, bireylerin yarıdan fazlasının hastaneye yattıktan sonra uyku alışkanlığında değişiklik olduğu, geceleri aynı saatte uyumadığı, gürültü, ağrı, vücuda takılı tıbbi cihazların, uyku düzenlerini etkilediği belirlenmiştir. Ayrıca hastanede kalma süresi, hastanede kalınan oda, stres, psikiyatrik hastalık, hastaneye yatmadan önce uyku sorununun var olmasının uyku kalitesini etkilediği; eğitim durumu, çalışma durumu, gelir durumu, aile tipi gibi sosyo-demografik özelliklerin ve kronik hastalık, sürekli kullanılan ilaç, menopoz öyküsünün uyku kalitesini etkilemediği saptanmıştır. Bu sonuçlar doğrultusunda; hastaların uyku kalitesini etkileyen etmenler net olarak tespit edilerek, gerekli önlemlerin alınması; gürültünün azaltılması, eski yatakların yenilenmesinin sağlanması, yastıkların daha konforlu olmasının sağlanması, ağrı kontrolünün sağlanması, hastalık ve yapılacak girişimlerle ilgili yeterli bilginin verilmesi, ayrıca kabul tanılamasında uyku aktivitesini sağlıklı bir şekilde değerlendirilmesi önerilebilir.

Etik

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Hasta Onayı: Çalışmaya dahil edilen tüm hastalardan bilgilendirilmiş onam formu alındı.

Hakem Değerlendirmesi: Editörler kurulu dışında olan kişiler tarafından değerlendirilmiştir.

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Sleep Quality in Pregnant Women Considering Maternal Age: A Cross-sectional Study

Gebelik Yaşına Göre Uyku Kalitesi Belirleyicileri: Kesitsel Bir Çalışma

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Abstract

Objective: This study aimed to determine the factors affecting the quality of sleep in pregnant women with respect to maternal age.

Materials and Methods: This cross-sectional study was conducted in the Gynecology and Obstetrics Outpatient Clinic of Bartın State Hospital. The research data were collected using questionnaires Whooley questions, Pittsburg sleep quality index, and the 12-item short-form health survey.

Results: This study included 135 pregnant women, of whom 43 were ≥35 years, 46 were 23-34 years, and 46 were ≤29 years old. The mean sleep quality score of the advanced maternal age group was 4.88 [standard deviation (SD), 2.27], which was lower than the maternal age group of 30-34 years (5.78; SD, 2.94) and ≤29 years (5.02; SD, 3.38). Of the total participants, 52.6% were poor sleepers. Approximately 65% of the participants were Whooley-positive. The mean of the physical and mental component summary was 43.04 (SD, 6.04) and 44.05 (SD, 6.03), respectively, for each maternal age group. No significant differences were found among the maternal age groups in terms of sleep quality, depression, and quality of life.

Conclusion: The study results revealed similar characteristics among pregnant women of advanced and young maternal age concerning quality of life, sleep quality, and maternal depression.

Keywords: Sleep, sleep quality, quality of life, antenatal depression

Öz

Amaç: Bu çalışma, gebelik yaşına göre uyku kalitesini etkileyen faktörleri belirlemeyi amaçlamaktadır.

Gereç ve Yöntem: Bu kesitsel çalışma, Bartın Devlet Hastanesi'nde Kadın Hastalıkları ve Doğum Polikliniği'nde yapılmıştır. Araştırma verileri anket formu, Pittsburg uyku kalitesi indeksi, Whooley soruları ve SF-12 yaşam kalitesi ölçeği kullanılarak toplanmıştır.

Bulgular: Bu çalışmaya toplam 135 gebe katılmıştır. Gebelerin 43'ü 35 yaş ve üzerinde, 46'sı 23-34 yaş aralığında ve 46'sı 29 yaş ve altındaydı. İleri anne yaş grubunun uyku kalitesi toplam puanı 4,88 [standart sapma (SS), 2,27], 30-34 yaş grubunun 5,78 (SS, 2,94) ve ≤29 yaş grubunun 5,02 (SS, 3,38) olarak hesaplandı. Katılımcıların yarısı (%52,6) kötü uyku kalitesine sahipti. Katılımcıların yaklaşık %65'inde Whooley pozitifti. Katılımcıların tamamı için fiziksel bileşen özetinin ortalaması 43,04 (SS, 6,04) ve mental bileşen özeti 44.05 (SS, 6,03) idi. Anne yaş grupları arasında uyku kalitesi, depresyon ve yaşam kalitesi açısından anlamlı fark bulunmadı.

Sonuç: Çalışma sonunda ileri yaş gebelerin, daha genç olanlar ile benzer şekilde düşük uyku kalitesi, depresyon ve yaşam kalitesine sahip olduğu bulundu.

Anahtar Kelimeler: Uyku, uyku kalitesi, yaşam kalitesi, gebelikte depresyon

Introduction

In recent years, with the increasing tendency to have childbearing in advanced ages worldwide, pregnancy rates of 35 years and older have also increased. Although definition of advanced maternal age (AMA) is globally not assertive, this term generally define as ''childbearing in a woman over 35 years of age'' (1). Many factors such as effective contraception methods, the increase in assisted reproductive technology, the insufficient financing status of young parents for child care, higher education level of women, and alongside the increase rate of employment of them in high positions contribute this growing tendency rate of childbearing at advanced ages (2).

AMA is especially more common in high-income countries. The rate of first births to women aged 35 and older is 9.1% in 2014 with an increase of 23% in the last 14 years in the United States (3). In England and Wales, the average age of mothers giving birth for the first time was 28.8 years in 2017 (4). In Turkey, median maternal age at first delivery has risen from 20.8 years in 1993 to 23.3 years in 2018 (5). Additionally, The national data shows that 16% of deliveries in Turkey in 2018 were among women 35 years and older and this percentage

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was almost 11% at the beginning of 2000s (6). These evidences show that there is a growing trend in being delayed moderhood among women in Turkey.

Most studies focusing on pregnant women with AMA are generally inquiry obstetrical outcomes (7,8) and maternal comorbidities. However, scientific publications on sleep quality of pregnant women in older age are rare. Some studies assert that age is one of the determinants for sleep quality (9,10), but there is not enough evidence to support an increased prevalence of poor sleep quality among AMA compared to other maternal ages.

Health-related quality of life (HRQoL) is affected during the pregnancy (11) and is shown a decrease along with the poor sleep quality (12). The sleep quality of women is one of the strong factors to predict HRQoL in pregnancy and adequate sleep is important for the optimal HRQoL of pregnant women (13). Additionally, the association between maternal age and HRQoL is a controversial issue (11) and there is a lack of scientific knowledge related to the HRQoL of pregnant women aged 35 years old and over, and its associations. The screening of HRQoL among pregnancy and its association e.g., sleep quality and depression is necessary (1,11) to improve the future wellbeing of pregnant women and obstetric outcomes such as postnatal depression, preterm delivery, increased incidence of low-birth-weight infants.

The poor sleep quality and low HRQoL score are closely related to antenatal depression (13). Although the majority of women do not report complaints regarding depression (11), the prevalence of depression among pregnant women is rather prevalent worldwide in particular low-income countries (14). In Turkey, studies show that the prevalence rate of depression in pregnancy is almost 30% for all maternal (15). Although maternal age considers a risk factor to increase antenatal depression, developing depression among women in AMA is rarely investigated (14).

Study Aims

The aim of the present study was therefore to define factors affeting sleep quality in pregnant women considering maternal age.

Research questions are as follow:

- What are the main predictors of sleep quality in pregnant women considering maternal age?
- Are there relationship between maternal depression, quality of sleep and quality of life in pregnant women considering maternal age?

Materials and Methods

Study design and setting

In this cross-sectional study, we recruited pregnant women who visited the Gynecology and Obstetrics Outpatient Clinic of The Bartın State Hospital for a routine health check between December 2019-March 2020. The inclusion criteria were the following: (a) Aged ≥18 years; (b) no severe maternal complications, (c) no serious health problems e.g., psychosis, major depression, cancer; (d) a singleton pregnancy.

Participants and data collection

Simple random sampling method was used in this study. The sample size was calculated using G-Power 3.1.9.7 based on the results of the previous studies (9), the effect size of quality of sleep in pregnant women aged ≥35, 30-34, and ≤29 years old were hypothesized 0.6. A power analysis revealed that a sample size of 37 each group when the effect size was 0.6, α (two-sided) was 0.05, and power was 0.8. Accounting for potential withdrawal and missing data, 43 participants were selected. In total, 135 pregnant women participated in the study, of whom 43 were ≥35 years of age, 46 were 30-34 years of age, and 46 were ≤29 years of age (16).

Data were collected using a paper-based survey including a questionnaire, the Whooley questions, item short form health survey-12 (SF-12), and Pittsburg sleep quality index (PSQI). The questionnaire designed based on the literature review and comprised of socio-demographic information and pregnancy history of participants. The socio-demographic information included age, pre-pregnancy weight, height, education level, and perceived income level. Body mass index (BMI) of participants was calculated by using pre-pregnancy weight (kilogram) and height (meter) (17). The obstetrical history consisted of gravida, parity, previous birth mode, miscarriage, presence of chronic diseases, live birth, and bad habits.

The sleep quality of participants was measured by the PSQI. This self-report scale is used to assess individuals' sleep quality over a one month time interval. The scale was validated with a Cronbach's alpha score of 0.80 by Ağargün et al. (18) in the Turkish context. PSQI compose seven components with 19 questions weighted on a scale of 0-3 that are used to calculate global score. A global score of >5 indicates that the individual's sleep quality is poor. Cronbach's alpha score was estimated as 0.74 in this study.

The Whooley questions was used for evaluation of perinatal depression (19). These questions comprise of three questions for defining aid and the help of perinatal depression. Pregnant women who answer one of the first two questions as ''yes'', those have to answer the third question as ''yes, but not today or no''. Participants responding either first two questions as ''yes'' were categorized as ''Whooley positive'', on the other hand those responding either first two questions as ''no'' were categorized as ''Whooley negative''. It is recommended that practitioners should be trained on how to be asked the Whooley questions (20). In the present study, the first author who have a Ph. D. degree asked the questions to pregnant women (21).

Health-related quality of pregnant women was assessed by SF-12. This questionnaire was created by obtaining 12 items from every eight dimensions of the item short-form health survey-36 (SF-36) which was validated with a Cronbach's alpha score range between 0.73 and 0.76 by Pınar (22) in the Turkish context. This survey contains eight components to evaluate the quality of life of individuals who are healthy or sick. SF-12 is a valid and practical alternative of SF-36. As for calculating SF-12 score, Ware et al.'s (21) scoring method was used to perform physical and mental standardization for each question. Then, physical standardization values and mental standardization

values were summed separately for each item. Finally, physical component summary (PCS) score and mental component summary (MCS) score were calculated by adding 56,57706 and 60,75781 respectively. The scores of PCS and MCS are calculated as values ranging from 0 to100. The higher scores shows higher quality of life.

Statistical Analysis

Demographic data was reported using descriptive analyses. Pearson's chi-squared tests or Fisher's Exact tests in case of the smallest theoretical frequency <5 were used to compare categorical variables. The normality of the research data were tested using Skewness and Kurtosis values. Analysis of variance (ANOVA) was performed to compare maternal age groups and continuous variables and Pearson correlation was performed to test correlation between continuous variables. Statistical Package for the Social Sciences (SPSS) for Windows version 25.0 was performed to the data analysis. P<0.05 was accepted for the significance level.

Ethics

The Ethics Committee of the Çanakkale Onsekiz Mart University (decree code: 2019/18) approved the study protocol. We informed pregnant women about the purpose of the study. Obtaining the informed consent to attend the study was guaranteed. The confidentiality of the data was assured by de-identifing of the questionnaires.

Results

Of the 135 responders recruited, 43 were 35 years old or over (mean age, 37.61±2.87 years; range 35 and 46 years), 46 were between 30 and 34 (mean age, 31.85±1.69 years; range 30 and 34 years) and 46 were 29 or younger (mean age, 24.09±3.28 years; range 18 and 29 years). Characteristics of participants (≥35) and other maternal ages are illustrated in Table 1. Over half of the participants (67.4%) were predominantly with normal pre-pregnant BMI, and almost half of them (44.4%) were university educated. The majority pregnant women (78.5%) perceived their income level as middle or low. Most pregnancy (88.1%) was a planned pregnancy and 62.2% of them were in the third trimester. The rate of gravida and parity were higher (58.7% and 32.6%, respectively) in AMA group (55.8% and 32.6% respectively) than other maternal age groups (23.9% in 30-34 maternal age and 13.0% in ≤29 maternal age; p=0.00 for gravida and 15.2% in 30-34 maternal age and 13.1% in ≤29 maternal age; p=0.01 for parity). The rate of the miscarriage was greater (48.8%) in the participants aged 35 years old or over than other groups (26.1% in the maternal age between 30 and 34, and 13.0% in the maternal age ≤29; p=0.00). Participants with AMA (30.2%) had more chronic diseases that other maternal age groups (15.2% in 30-34 maternal age and 8.7% in ≤29 maternal age; p=0.03). Most previous birth mode (61.2%) was vaginal, majority previous birth (93.1%) was alive, and participants did not predominantly use tobacco or alcohol. There were significant differences among maternal age groups according to gravida, parity, miscarriage, and chronic diseases among included characteristics.

Quality of life, depression, and sleep quality of participants according to the age groups are shown in Table 2. The PSQI global score of AMA group was 4.88 [standard deviation (SD) 2.27] compared to maternal age group 30-34 with 5.78 (SD 2.94) and maternal age group ≤29 with 5.02 (SD 3.38). 52.6% of the total participants were poor sleepers. Pregnant women mostly had very good subjective sleep quality (92.6%). Although most participants (73.3%) had ≥16 minutes of sleep latency, 65.9% of pregnant women had >7 hours sleep duration and 63.7% of them had ≥85% sleep efficiency. In the range from 1 to 9 sleep disturbance was 67.4% and more than half of the participants had 1 to 2 daytime dysfunctions (57.0%). The majority pregnant women did not take any sleeping medication (69.6%). Approximately 65% of pregnant women were Whooley positive. The mean of the PCS was 43.04 (SD 6.04) and the MCS was 44.05 (SD 6.03) for each maternal age group. We did not find any significant differences among maternal age groups in terms of quality of life, sleep quality, and depression.

Correlations beween quality of life, depression, quality of sleep, and age are shown in Table 3. The mean global PSQI score was 5.24 (SD= ±2.92, range 0 to 15), PCS was 43.04 (SD= ±6.03, range 28.10 to 58.08), MCS was 44.04 (SD= ±6.04, range 29.97 to 61.18), and age was 31.03 (SD= ±6.15, range 18 to 46). PSQI had moderate correlation with PCS [r=-0.330, 95% confidence interval (CI) raging -0.24 to 0.08]. PCS had moderate correlation with PSQI (r=-0.330, 95% CI raging -0.24 to 0.08) and had a weak correlation with MCS (r=- 0.170, 95% CI raging -0.34 to -0.00). Additionally, there were a weak correlation between age and depression.

The logistic regression were presented in Table 4. Factors included in this study explained 22% of variance in the poor sleep quality. PCS was the main predictor of poor sleep quality (odds ratio=0.90, 95% CI: 0.84-0.97, p=0.006).

Discussion

The present study shows that the main predictor of poor sleep quality was PCS of quality of life. Additionally, this study reveals that sleep quality, maternal depression, and quality of life in pregnant women with AMA were similar to those younger ages. A previous study including nullipara women reported that poor quality of sleep, poor physical health, and maternal depression were quire prevalent among pregnant women with AMA and very AMA compared to those with younger maternal ages (23). However, a study conducting in Vietnam reported that multipara women were poor sleepers compared to nullipara women regardless of maternal age differences (10). Previous studies reported that the rate of poor sleep quality among pregnant women was a range from 43% to 87% (9,10,24-26). Our present findings support previous results by showing 52.6% of poor sleep quality in the total sample.

A previous meta-analysis study reported that quality of sleep decreases as gestational age increase according to a comparison between the youngest sample (mean age, 23.8 years of age; standart deviation 4.1) and the oldest (mean age, 33.5 years of age; standart deviation 4.1) (24). Additionally, another study

Table 1. Characteristics of participants (n=135)					
Characteristics	**Maternal age ≥35 n (%) n=43**	**Maternal age 30-34 n (%) n=46**	**Maternal age ≤29 n (%) n=46**	**χ^2**	**p**
Pre-pregnancy BMI (kg/m²)					
Normal weight	27 (62.8)	28 (60.9)	36 (78.3)	3.779	0.15
Overweight-obese	16 (37.2)	18 (39.1)	10 (21.7)		
Education level					
Elementary school	9 (20.9)	8 (17.4)	12 (26.1)	3.198	0.53
High school	17 (14.7)	13 (15.7)	16 (15.7)		
University	17 (39.5)	25 (28.3)	18 (34.8)		
Perceived income level					
High	11 (25.6)	7 (15.2)	11 (23.9)	1.660	0.44
Middle-low	32 (74.4)	39 (84.8)	35 (76.1)		
Planned pregnancy					
Yes	39 (90.7)	42 (91.3)	38 (82.6)	2.057	0.41
No	4 (9.3)	4 (8.7)	8 (17.4)		
Gestational age					
1st trimester (weeks 0-13)	2 (4.7)	1 (2.2)	7 (15.2)	1.648	0.21[a]
2nd trimester (weeks 14-28)	13 (30.2)	16 (34.8)	12 (26.1)		
3rd trimester (weeks ≥29)	28 (65.1)	29 (63.0)	27 (58.7)		
Gravida					
1	7 (16.3)	16 (34.8)	27 (58.7)	26.862	0.00*
2	12 (27.9)	19 (41.3)	13 (28.3)		
≥3	24 (55.8)	11 (23.9)	6 (13.0)		
Parity					
0	12 (27.9)	22 (47.8)	29 (63.0)	12.831	0.01*
1	17 (39.5)	17 (37.0)	11 (23.9)		
≥2	14 (32.6)	7 (15.2)	6 (13.1)		
Miscarriage					
No	22 (51.2)	34 (73.9)	40 (80.0)	14.127	0.00*
Yes	21 (48.8)	12 (26.1)	6 (13.0)		
Previous birth mode[b]					
Vaginal	15 (48.4)	16 (66.7)	9 (52.9)	1.892	0.39
Caesarean	16 (51.6)	8 (33.3)	8 (47.1)		
Live birth[c]					
No	6 (16.7)	8 (26.7)	4 (21.1)	0.981	0.61
Yes	30 (83.3)	22 (73.3)	15 (78.9)		
Chronic diseases					
No	30 (69.8)	39 (84.8)	42 (91.3)	7.365	0.03*
Yes	13 (30.2)	7 (15.2)	4 (8.7)		
Bad habits					
No	33 (76.7)	39 (84.8)	35 (76.1)	2.158	0.79*
Tobacco Alcohol	8 (18.6) 1 (2.3)	7 (15.6) 0 (0.0)	9 (19.1) 2 (4.3)		

*<0.05; [a]Fisher's Exact test, [b]Text was calculated on the number of parity, 72 sample, [c]Test was calculated on the number of gravida, 85 sample, BMI: Body mass index

Table 2. Comparison of quality of life, depression, and quality of sleep (n=135)					
	Maternal age ≥35 n (%) n=43	**Maternal age 30-34 n (%) n=46**	**Maternal age ≤29 n (%) n=46**	**χ^2/F**	**p**
Global PSQI score (0-21); M (SD)	4.88 (2.27)	5.78 (2.94)	5.02 (3.38)	1.247	0.29
Sleep quality					
Poor sleeper	20 (46.5)	30 (65.2)	21 (45.7)	4.467	0.11
Good sleeper	23 (53.5)	16 (34.8)	25 (54.3)		
Subjective sleep quality					
Very good	40 (93.0)	42 (91.3)	43 (93.5)	0.282	0.92[a]
Fairly good-very bad	3 (7.0)	4 (8.7)	3 (3.4)		
Sleep latency (min)					
≤15 16-30 31-59	11 (25.6) 15 (34.9) 15 (34.9)	9 (19.6) 15 (32.6) 17 (37.0)	16 (34.8) 15 (32.6) 8 (17.4)	8.197	0.22[a]
≥60	2 (4.7)	5 (10.9)	7 (15.2)		
Sleep duration					
>7 h	31 (72.1)	26 (56.5)	32 (69.6)	2.810	0.26
≤6 h	12 (27.9)	20 (43.5)	14 (30.4)		
Sleep efficiency					
≥85%	30 (69.8)	27 (58.7)	29 (63.0)	1.191	0.55
<85%	13 (30.2)	19 (41.3)	17 (37.0)		
Sleep disturbance (a week)					
0 1-9	1 (2.3) 35 (81.4)	4 (8.7) 26 (56.5)	4 (8.7) 30 (65.2)	6.809	0.14[a]
10-27	42 (16.3)	42 (34.8)	42 (26.1)		
Daytime dysfunction (a week)					
0 1-2 3-4	3 (7.0) 26 (60.5) 12 (27.9)	7 (15.2) 24 (52.2) 14 (30.4)	10 (21.7) 27 (58.7) 6 (13.0)	8.234	0.20[a]
5-6	2 (4.7)	1 (2.2)	3 (6.5)		
Use of sleeping medication					
None	31 (72.1)	32 (69.6)	31 (67.4)	0.232	0.89
≥1 in a week	12 (27.9)	14 (30.4)	15 (32.6)		
Whooley questions					
Positive	33 (76.7)	30 (65.2)	24 (52.2)	5.874	0.05
Negative	10 (23.3)	16 (34.8)	22 (47.8)		
Quality of life					
PCS; M (SD)	42.23 (5.74)	42.94 (5.92)	43.89 (6.44)	0.849	0.43
MCS; M (SD)	42.85 (5.23)	44.88 (6.01)	44.35 (6.66)	1351	0.26

[a]Fisher's Exact test, M: Mean, SD: Standard deviation, PSQI: Pittsburgh sleep quality index, PCS: Physical component summary, MCS: Mental component summary

including a sample whose age was range from 19 to 40 years (mean age 28.5 years) demonstrated that older maternal age was significantly associated with poor sleep quality (9).

Our study findings does not define any significant correlation between age (mean age, 31.03 SD 6.15) and sleep quality. 53.5% of participants with AMA were good sleepers and there is no significant differences between maternal age groups. The good sleep quality may be related to characteristics of our study sample whose mean age was 37.61 years (SD 2.87). Although there were no significant differences between age groups, participants with AMA had lower global PSQI score which was below the cut-off score of 5 compared to those younger maternal ages. Additionally, the global PSQI score was 5.24 (SD 2.92) in each maternal age group. This result was not consistent with previous studies (9,24,25) by determining lower PSQI score in each maternal age group.

As regards to dimensions of PSQI, this study did not find any significant differences between age groups in any dimension. A

Table 3. Means, standard deviations and Pearson correlations with confidence interval among global PSQI score, PCS, MCS, and age in each age group

Variables	M	SD	1	2	3	4
1. PSQI	5.24	2.92				
2. PCS	43.04	6.04	-0.330** (-0.24- -0.08)			
3. MCS	44.04	6.03	0.109 (-0.03- 0.14)	-0.170* (-0.34- -0.00)		
4. Age	31.03	6.15	-0.020 (-0.4 - 0.32)	-0.064 (-0.24-0.11)	-0.093 (-0.27-0.08)	
5. Depression	1.36	0.48	0.16 (1.33-1.66)	0.08 (0.50-1.68)	0.16 (0.19-1.39)	-0.17* (1.35-2.19)

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed), PSQI: Pittsburgh sleep quality index, PCS: Physical component summary, MCS: Mental component summary, SD: Standard deviation

Table 4. Factors associated with poor quality sleep

	OR	%95 CI	p
Age	1.02	0.95-1.10	0.517
Educational level	1.28	0.78-2.09	0.322
Perceived income level	1.06	0.49-2.29	0.880
Gestational age	1.04	0.99-1.09	0.087
Gravida	1.04	0.99-1.09	0.087
Parity	0.36	0.01-9.22	0.534
Miscarriage	0.18	0.01-7.60	0.367
Live birth	0.40	0.09-1.71	0.214
Planned pregnancy			
Yes	1.00		
No	1.67	0.50-5.55	0.406
Tobacco			
Yes	1.00		
No	1.35	0.47-3.86	0.581
Whooley			
Positive	1.00		
Negative	0.81	0.36-1.85	0.630
Physical component summary	0.90	0.84-0.97	0.006
Mental component summary	1.01	0.95-1.08	0.697

OR: Odds ratio, CI: Confidence interval

previous study showed that individuals grew older, they have longer sleep latency time before the sleep onset regardless of their gender. Especially, 37 years of age is the breaking point for increasing sleep onset latency (27). Similarly, our study findings portrayed that pregnant women in each age group had longer sleep latency, and those with AMA did not have a different trend in sleep onset latency as well as other dimensions of PSQI. Our present findings regarding sleep onset latency, sleep duration, and high sleep efficiency has consisted of the results of the Huong et al.'s (10) study. However, the number of sleep disturbance and daytime dysfunction in a week was higher in our study sample than Huong et al.'s (10) study sample. Moreover, almost one-third of pregnant women in our study used sleeping medications contrary to none in previous studies (10,28).

According to a finish study, the prevalence of depression among pregnant women was 6.3% (29). Previous studies reported a significant bidirectional association between sleep quality and prenatal depression (9,24,25). In other words, poor sleep quality could be used as a predictor to define depression in pregnancy and poor sleep quality was aggravated by the presence of prenatal depression. Our present findings showed that 64.4% of pregnant women responded to the Whooley questions as positive and there was no significant difference in terms of AMA. Another distinction from previous studies, this study did not define any significant correlation between MCS of HRQoL and quality of sleep.

The association between quality of life, poor sleep quality (11,30,31) and prenatal depression (11,31) were reported in previous studies. Previous studies on quality of life in pregnancy indicated that PCS ranging from 45 to 50 and MCS was ranging from 47 to 57 (32) which were higher than our previous findings. The decreased quality of life may be relevant to the prevalence of tobacco or alcohol consumptions in our study sample (11). Our study findings supports an association between poor sleep quality and quality of life, but we did not find a difference between AMA and quality of life. These results were consistent with previous studies (11,30). However, most previous studies have studied the quality of life and its associations among pregnant women, only a few studies reported quality of life in AMA (11,30). According to current knowledge, it is unclear that there is an association between HRQoL and increased maternal age (30).

Study Limitations

Several limitations should be considered in this study. First of all, our sample was selected from the gynecology and obstetrics outpatient clinic of a state hospital, and so the findings of previous study does not be generalized to the general population. In the second place, sleep quality was assessed by PSQI as subjectively only. In addition, we did not collect data on sleep hygiene practices, physical activity, a working status which those variables may confound our study findings. We advise a larger sample group taken into account

a separation in which trimester pregnant women with AMA are and using an actigraph for evaluation of sleep quality of participants as objectively as well as self-report assessments for the future studies. Lastly, perinatal depression was only assessed by asking Whooley questions. Therefore, we recommed that furher studies should be conducted to compare Whooley questions and other depression scales in screening for perinatal depression in Turkey.

Conclusion

The present study illustrated that pregnant women with AMA had the similar characteristic to experience poor sleep quality, depression, low quality of life as younger maternal ages. Moreover, it was determined that the main predictor of poor sleep quality was PCS of quality of life. Taking into accond the increasing trend of AMA and their high risk of obstetric outcomes, healthcare professionals need to be conscious of the high risk of poor sleep quality, low quality of life, and depression which are closely related to poor obstetric outcomes. In particular, nurses and midwives as frontline healthcare providers can make an important contribution to improving pregnant women's quality of sleep, mental health, and quality of life through counseling, education programs, and pregnant schools.

With the role of the women in the modern working world, women conceive and give birth at advanced age compared to their previous generations. Increased knowledge about the quality of sleep in pregnancy and its bidirectional relationship with perinatal depression and quality of life is needed to develop strategies to prevent the negative effects of these factors on prenatal and fetal outcomes.

Ethics

Ethics Committee Approval: The Ethics Committee of the Çanakkale Onsekiz Mart University (decree code: 2019/18) approved the study protocol.

Informed Consent: Obtaining the informed consent to attend the study was guaranteed. The confidentiality of the data was assured by the-identifying of the questionnaires.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: İ.D., S.S., E.C., Design: İ.D., S.S., E.C., Data Collection or Processing: İ.D., Analysis or Interpretation: İ.D., Literature Search: İ.D., S.S., E.C., Writing: İ.D., S.S., E.C.

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Factors That Affect Sleep Quality in Hospitalized Patients with COVID-19 Pneumonia

COVID-19 Pnömonisi ile Hastanede Yatan Hastalarda Uyku Kalitesini Etkileyen Faktörler

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Abstract

Objective: Sleep is important for metabolism and the immune system. Disturbed sleep may be a risk factor for poor recovery from diseases. Coronavirus disease-2019 (COVID-19) pneumonia has been the most common cause of hospitalization in the last year. This study aimed to evaluate the sleep quality of hospitalized patients with COVID-19 pneumonia and the factors that affect their sleep quality.

Materials and Methods: This cross-sectional study included patients with COVID-19 pneumonia who were hospitalized at a pandemic clinic. The demographic data, symptoms, laboratory parameters, and hospitalization duration were evaluated. After the first night of admission, the patients completed Pittsburgh sleep quality index (PSQI) and hospital anxiety and depression scale (HADS).

Results: This study included 105 patients, of whom 55 were with mild-moderate pneumonia and 50 with severe pneumonia. The mean value of the total PSQI score was 8.43±2.03 in the non-severe group and 12.64±2.24 in the severe group. Positive correlations were found between the total PSQI score and age, HAD-A score, HAD-D score, length of hospital stay, and ferritin. Negatively significant correlations were found between the PSQI score and leukocyte count, lymphocyte count, albumin, and oxygen saturation. Independent factors, such as disease severity, HADS scores, oxygen saturation, and dyspnea, were associated with the total PSQI score (R^2=0.630).

Conclusion: Patients who are hospitalized with COVID-19 pneumonia had poor sleep quality. Sleep quality was affected by disease severity. Anxiety and depression levels, oxygen saturation, and dyspnea are associated with sleep quality in these patients.

Keywords: COVID-19 pneumonia, sleep quality, anxiety, depression, hospitalization

Öz

Amaç: Uyku, metabolizma ve bağışıklık sistemi için önemlidir. Kötü uyku, hastalıkların zayıf iyileşmesi için bir risk faktörü olabilir. Koronavirüs hastalığı-2019 (COVID-19) pnömonisi son bir yılda en sık hastaneye yatış nedeni olan enfeksiyondur. Bu çalışmanın amacı, hastanede yatan COVID-19 pnömonili hastaların uyku kalitesini değerlendirmek ve etkileyen faktörleri belirlemektir.

Gereç ve Yöntem: Çalışmamız, pandemi kliniğinde yatan COVID-19 pnömonili hastaları içeren kesitsel bir çalışmadır. Demografik veriler, semptomlar, enflamasyon belirteçleri, hastanede kalış süresi, anksiyete ve depresyon durumu değerlendirilmiştir. Katılımcılara, hastaneye yatışlarının ertesi gününde Pittsburgh uyku kalitesi indeksi (PUKİ) ve hastane anksiyete ve depresyon ölçeği (HADS) uygulanmıştır.

Bulgular: Çalışmaya 105 gönüllü hasta dahil edildi. Elli beşi hafif-orta pnömonili, 50'si ağır pnömonili hastalardı. Toplam PUKİ puanının ortalama değeri şiddetli olmayan grupta 8,43±2,03, şiddetli grupta 12,64±2,24 olarak saptandı. Toplam PUKİ puanı ile yaş, HAD-A skoru, HAD-D skoru, hastanede yatış süresi ve ferritin arasında pozitif yönde; lökosit sayısı, lenfosit sayısı, albümin ve oksijen satürasyonu arasında negatif yönde anlamlı korelasyon bulundu. Hastalık şiddetinin, HADS skorlarının, oksijen satürasyonunun ve dispnenin, toplam PUKİ puanını etkilediği saptandı (R^2=0,630).

Sonuç: COVID-19 pnömonisi ile hastaneye yatırılan hastaların uyku kalitesi kötüdür. Uyku kalitesi hastalık şiddetinden etkilenmektedir. Bu hastalarda anksiyete ve depresyon düzeyleri, oksijen satürasyonu ve dispne uyku kalitesi ile ilişkilidir.

Anahtar Kelimeler: COVID-19 pnömonisi, uyku kalitesi, anksiyete, depresyon, hospitalizasyon

Introduction

Sleep is very important for the maintenance of both physiological and psychological well-being of the individual. Sleep is a form of rest that can be interrupted by stimuli of different degrees and creates changes in the state of consciousness and is also a necessity for a healthy and long life where the body renews itself (1). Sleep-wake cycle of hospitalized patients is variable. Their circadian rhythms are disrupted. Sick individuals have

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decreased sleep quality which adversely affecting their illness and health conditions (2). An association has been reported between sleep quality of hospitalized patients and functional improvement during the first 3 months after discharge and increased mortality risk within a year (3,4). Sleep disturbance may be a risk factor for late recovering from hospitalizations (5) or prolonged hospital stay depending on the severity of the disease may impair sleep quality.

Millions of people have been affected by the Coronavirus disease-2019 (COVID-19) that was caused by the severe acute respiratory syndrome-coronavirus-2. It has been shown that the novel infectious diseases, such as severe acute respiratory syndrome have effects on sleep by increasing anxiety, depression, and stress levels in the general population (6).

The Pittsburgh sleep quality index (PSQI) is a well-known questionnaire to determine sleep disturbances in adults (7). PSQI is commonly used for monitoring the sleep over the past one month. The hospital anxiety and depression scale (HADS) is a self-assessment scale that was developed for determining the risk of anxiety and depression in patients with somatic diseases (8).

There are some typically changes in laboratory parameters of patients with COVID-19 pneumonia. Inflamatory markers such as C-reactive protein (CRP), procalcitonin and serum ferritin, haematological parameters such as white blood cell (WBC) count, lymphocyte count and coagulation markers such as D-dimer have been associated with the disease severity and prognosis (9).

Sleep impairment was reported frequent in patients with COVID-19 (10), that may be due to isolation, physical discomfort, and psychological factors such as fear, anxiety or depression (11). Poor sleep quality during hospitalization in COVID-19 patients was reported as associated with a slow recovery from lymphopenia and an increased need for intensive care (12).

The aim of this study was to evaluate the sleep quality and the factors affecting the sleep quality of hospitalized patients with COVID-19 pneumonia.

Materials and Methods

This study was performed in accordance with the Declaration of Helsinki and was approved by the Muğla Sıtkı Koçman University Human Research Ethics Committee (protocol number: 200179, decision no: 150). All patients provided signed informed consent to participate in the study.

Patients with COVID-19 pneumonia who were hospitalized at pandemic clinic of Muğla Sıtkı Koçman University Education and Training Hospital between 15 July-15 October 2020 were included. Adult patients over the age of 18 who had accepted to participate in were enrolled to the study. The patients who had any diagnosed sleep related disorders, neurological and psychiatric diseases were excluded. This is a cross-sectional study. The demographic data (age, gender, occupation, smoking, comorbidity, body mass index), symptoms, laboratory parameters within 24 h of admission and length of hospitalization stay were recorded. The patients completed PSQI and HADS after the first night of admission for minimalizing the hospital factors (e.g., light exposure, sound exposure, and disturbance by staff) that could be the reason of poor sleep quality during hospitalization.

The questionnaires were performed face to face in patients' room. Clinicians wore personel protective equipments and the patients wore surgical masks during the survey which took maximum 15 minutes.

The PSQI questionnaire that consisted of seven parts a total of 18 items, including sleep quality, sleep duration, sleep latency, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction was used to measure the sleep quality of the patients. Each part was scored from 0-3, and the total score ranged from 0-21. A high score is accepted as indicating poor sleep quality (13).

The HADS translated to Turkish, validity and reliability study has been done (14). It has anxiety (HAD-A) and depression (HAD-D) subscales. Totally contains 14 questions. Seven of them (odd numbers) measures anxiety and the other seven (even numbers) measures depression. It provides a quadruple Likert type measurement. According to the results of the study performed in Turkey, the subscale cut-off score for anxiety was 10/11, the subscale cut-off score for depression was 7/8. The scores above these are considered as risk group. The lowest score can be obtained from both subscales is 0, while the highest score is 21.

Statistical Analysis

Data analysis was done by the SPSS program version 23.0. The sample sizes required for independent sample t-test and chi-square tests by using the G-Power software at medium effect size. Patients with COVID-19 pneumonia were divided into two groups. Patients who had the value of SpO_2 under 94% on room air, a ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO_2/FiO_2) below 300 mm Hg, respiratory frequency over 30 breaths per minute, or lung infiltrates more than 50% were considered as severe. Individuals who had any of the various signs and symptoms of COVID-19 (e.g., fever, cough, sore throat, malaise, headache, muscle pain, nausea, vomiting, diarrhea, loss of taste and smell), dyspnea, or abnormal chest imaging with the value of SpO_2 over 94% considered as non-severe.

Descriptive statistics in the form frequencies and percentages were used to describe the demographics. Means and standard deviations (mean ± standard deviation) were analyzed by a t-test if the data showed normally distribution) and Mann-Whitney U test. Chi-square test was used for categorical data. The relationships between parameters were calculated with correlation coefficient. Normally distributed data were calculated with the Pearson Correlation Coefficient, Spearman Rank Correlation was used to calculate the data that did not show normal distribution. To determine the factors affecting sleep quality in 105 patients with COVID-19 pneumonia, the relationship between total PSQI score and the other parameters was examined. Logistic regression analysis was used to identify parameters that affect PSQI. $P<0.05$ was accepted as the level of significance.

Results

One hundred-five individuals from the patients, who were treated at the covid ward in Muğla Sıtkı Koçman University Training and Research Hospital during the period of 15 July 2020 to 15 October 2020, agreed to participate in the study. Fifty-five of the patients had non-severe COVID-19 pneumonia, 50 of the patients had severe COVID-19 pneumonia. The demographic data of the participants is shown in Table 1. Patients with non-severe COVID-19 pneumonia were younger than the patients with severe infection. The number of male individuals were higher in patients with severe COVID-19 pneumonia. Alcohol use and hypertension were more common in the severe group. Dyspnea and gastrointestinal symptoms such as diarrhea and abdominal pain were more frequent in the severe COVID-19 pneumonia whereas anosmia was more frequent in the non-severe group. The clinical features of the patients are summarized in Table 1. HAD-A and HAD-D scores in patients with severe COVID-19 pneumonia were significantly higher than the non-severe group (Table 2). The total PSQI questionnaire score of the study patients was 10.43±2.99 (6.00-17.00) and it was was significantly higher in the severe patients. The comparison of sub-scales of the PSQI questionnaire were shown in Table 2. Laboratory parameters associated with inflammation and coagulation were higher whereas the WBC and lymphocyte counts and albumin were lower in non-severe COVID-19 pneumonia patients (Table 3). The total PSQI score of the patients with COVID-19 pneumonia had positive correlations with both HAD-A and HAD-D scores. There were significant correlations between total PSQI score and age, hospitalization day and ferritin. There were significant negative correlations between total PSQI score and WBC, lymphocyte, albumin and oxygen saturation. However, total PSQI score had no significant correlations between age, body mass index (BMI), comorbidity, smoking. Correlations between total PSQI score and factors affecting sleep quality are summarized in Table 4. Total PSQI score was significantly associated with HAD-A, HAD-D, oxygen saturation, hospitalization time, disease severity and dyspnea (R^2=0.630). Multiple regression analysis results were shown in Table 5.

Discussion

In our study, the sleep quality of patients hospitalized with COVID-19 was poor. Hospital depression and anxiety scores of the patients with COVID-19 pneumonia were high. We found that the disease severity, hospitalization days, dyspnea, oxygen saturation, hospital depression and anxiety scores affect the sleep quality of these patients significantly. WBC, lymphocyte, albumin and ferritin levels were significantly related with the total PSQI score.

PSQI is a reliable and consistent survey, it is used in many patient groups.Having a PSQI global score of 5 or above indicates poor sleep quality as shown in several studies (15,16). Since the mean value of total PSQI score 10.43±2.99 in our study, we thought that our patients hospitalized with COVID-19 pneumonia had poor sleep quality. The low values of sleep duration subscales (PSQI 2) and sleep latency (PSQI 3) may be determined as results of the disease severity.

Table 1. Demographic data and clinical features

	Non-severe (n=55)	Severe (n=50)	p
Age (years)	45.65±16.31	51.42±13.01	**0.049**
Gender (female/male) (n)	38/17	21/29	**0.005**
Marital status (married/single) (n)	39/16	43/7	0.062
BMI (kg/m^2)	26.17±3.70	26.24±2.62	0.918
Smoking (yes/no) (n)	22/33	25/25	0.303
Smoking pack-years	8.49±12.67	11.66±13.35	0.294
Comorbidity (yes/no) (n)	22/33	25/25	0.303
HT (yes/no)	10/45	18/32	**0.039**
DM (yes/no)	8/47	9/41	0.631
CAD (yes/no)	4/51	5/45	0.618
COPD (yes/no)	4/51	6/44	0.410
Asthma (yes/no)	5/50	10/40	0.111
Fever (yes/no)	44/11	45/5	0.154
Cough (yes/no)	43/12	44/6	0.182
Dyspnea (yes/no)	17/38	47/3	**<0.001**
Anosmia (yes/no)	13/42	4/46	**0.002**
GIS symptoms (yes/no)	9/37	11/29	**0.030**
Myalgia (yes/no)	35/20	32/18	0.969
Hospitalization day (n)	7.32±2.53	16.92±5.12	**<0.001**

BMI: Body mass index, HT: Hypertension, DM: Diabetes mellitus, CAD: Coronary artery disease, COPD: Chronic obstructive pulmonary disease, GIS: Gastrointestinal

Table 2. PSQI and HADS scores			
	Non-severe (n=55)	**Severe (n=50)**	**p**
Sleep quality	1.3±0.6	2.8±0.6	**<0.001**
Sleep duration	2.5±0.7	2.1±0.7	**<0.001**
Sleep latency	2.7±0.5	2.4±0.6	**0.003**
Habitual sleep efficiency	0.2±0.7	1.8±0.8	**0.026**
Sleep disturbances	1.3±0.7	2.2±0.7	**<0.001**
Use of sleeping medications	0.02±0.1	0.4±0.5	**<0.001**
Daytime dysfunction	0.4±0.7	1.4±1.0	**<0.001**
PSQI total	8.43±2.03	12.64±2.24	**<0.001**
HAD-A	8.01±3.38	13.18±3.53	**<0.001**
HAD-D	9.00±3.29	11.76±3.70	**<0.001**
PSQI: Pittsburgh sleep quality index, HADS: Hospital anxiety and depression scale, HAD-A: Hospital anxiety and depression-anxiety, HAD-D: Hospital anxiety and depression-depression			

Table 3. Laboratory parameters			
	Non-severe (n=55)	**Severe (n=50)**	**p**
WBC (mcL)	5.57±2.51	8.20±4.68	**0.003**
Lymphocyte (mcL)	1.48±0.67	0.96±0.59	**<0.001**
D-dimer (ng/mL)	486.21±935.37	604.77±669.28	0.096
Ferritin (mL/ng)	203.46±213.66	683.97±746.64	**<0.001**
CRP (mg/L)	21.73±35.10	78.82±95.65	**0.003**
Procalcitonin (ng/mL)	0.08±0.07	1.42±6.64	**0.005**
Albumin (g/dL)	40.24±4.78	36.27±5.69	**<0.001**
WBC: White blood cells, CRP: C-reactive protein			

Table 4. Correlations between PSQI and factors affecting sleep quality											
			Age	**HAD-A**	**HAD-D**	**Hospitalization day**	**WBC**	**LYM**	**Alb**	**Ferr**	**SpO_2**
Spearman's Rho	PSQI	r	0.268	0.552	0.402	0.515	-0.242	-0.303	-0.311	0.269	-0.622
		p	**0.007**	**<0.001**	**<0.001**	**<0.001**	**0.015**	**0.001**	**0.002**	**0.007**	**<0.001**
PSQI: Pittsburgh sleep quality index, HAD-A: Hospital anxiety and depression-anxiety, HAD-D: Hospital anxiety and depression-depression, WBC: White blood cells, LYM: Lymphocyte, Alb: Albumine, Ferr: Ferritin, SpO_2: Oxygen saturation											

Table 5. Multiple regression analysis results for PSQI and independent variables							
Variable	**Unstandardized**		**95% CI for B**		**Standardized**		**p**
	B	**SE**	**Lower limit**	**Upper limit**	β	**t**	
HAD-A	0.153	0.074	0.006	0.301	0.221	2.062	0.042
HAD-D	0.158	0.077	0.006	0.311	0.198	2.060	0.042
SpO_2	-0.332	0.081	-0.494	-0.171	-0.448	-4.080	<0.001
Hospitalization day	0.161	0.044	0.073	0.249	0.336	3.640	<0.001
Disease severity	4.356	0.446	3.471	5.242	0.730	9.762	<0.001
Dyspnea	-3.058	0.550	-4.150	-1.967	-0.500	-5.560	<0.001
PSQI: Pittsburgh sleep quality index, HAD-A: Hospital anxiety and depression-anxiety, HAD-D: Hospital anxiety and depression-depression, SpO_2: Oxygen saturation, CI: Confidence interval							

Decreased sleep time due to being sick and the change of sleep environment as a result of hospitalization can affect sleep wake cycle and causes daytime somnolence (17). In several studies, poor sleep quality was frequently observed in hospitalized patients (18). Sleep disorders may occur in patients with COVID-19 (10). Isolated environment, physical discomfort, or emotions (fear, anxiety and/or depression, etc.) may the responsible risk factors (11). In a study, strong relationship between evening electronic device usage during the lockdown period and sleep disturbances has been shown

(19). It has been reported that poor sleep quality impairs emotional regulation and increases affective reactivity (20) and it is associated with increased negative emotions (21). Poor sleep quality has been associated with stress, depression and anxiety during the COVID-19 pandemic in the general population (22). It was found that as the severity of the disease increased, the anxiety and depression scales increased. This may depend on the stress factors about the COVID-19 infection. Stress has shown to be associated with sleep quality (23). In a study (24), it has been reported that people who focus COVID-19 disease for 3 hours or more had significantly higher depression scores. Uncertain prognoses and treatment, loss of relatives, being unemployed indefinitely and financial losses may contribute to emotional distress and increase the risk for psychiatric diseases (25). Sleep interruption is one of the most common symptom of depression (26). As a finding supporting the literature, hospital depression and anxiety scores of our patients were high and significantly associated with the poor sleep quality. Not only depression and anxiety, also musculoskeletal disorders, obesity and other chronic diseases can cause sleep disorders (27).

Studies of large cohorts have shown that sleep quality in smokers is significantly reduced compared to non-smokers (28,29). There was no significant effect of smoking on sleep quality in our COVID-19 patients.

In a study from Brazil, it was reported that monthly income, occupation, gender, age and marital status had effects on sleep quality (30). But, we did not find any significant effect of gender, age and marital status on sleep quality in our study.

Sleep has an important role for human immune system and metabolism (31). Sleep disturbance impairs immune responses and activates inflammation (32). Shorter sleep time or poor sleep quality could increase the risk of upper respiratory infections (33). Septic patients with impaired sleep integrity have been reported with higher mortality rates (34). In a recent study, it was reported that poor sleep quality was associated with the recovery time of lymphopenia and the need for intensive care in hospitalized COVID-19 patients (35).

Laboratory parameters associated with inflammation (CRP) and coagulation (D-dimer) were higher whereas the WBC and lymphocyte counts and albumin were lower in non-severe COVID-19 pneumonia patients in our study. The prolongation of hospital stay in our patients with severe inflammation and lymphopenia may be due to poor sleep quality.

Dyspnea was associated with sleep quality significantly in our study. As a result of increased airway resistance, nocturnal bronchoconstriction occurs, which is due to normal circadian changes in the airways (36). In addition, decreased intercostal muscle activity during sleep may increase the symptoms of the patient with COVID-19 pneumonia. Poor sleep quality in patients with pneumonia; it can also be due to many reasons such as drugs used for treatment, disease symptoms, comorbidities, anxiety and depression. However, there was no association between sleep quality and comorbidities in our patients. Respiratory disturbances during sleep may be associated with oxygen desaturation and development of hypoventilation. This may be the reason of the negative significant correlation between oxygen saturation and sleep quality in our study.

Some variables might interact with each other in our study. The disease severity might increase stress, stress might increase anxiety and depression. Increased depressive mode might lead to poor sleep quality. The poor sleep quality might delay the recovery time since sleep has an important role in immune system. There was no interactions between sleep quality and age, gender, BMI, alcohol or smoking. This result might be due to the small number of patients included in the study. We collected the data of the patients who could cooperate with us and finish the questionnaire. The small size of qualitative samples is a limitation of this research.

Conclusion

The findings from this study showed that anxiety and depression of the hospitalized patients with COVID-19 pneumonia were at high levels, while the sleep quality was low. Both anxiety and depression had effects on sleep quality. This study showed a significant association between poor sleep quality and the prolonged hospitalization time. Disease severity was a significant risk factor for sleep quality. Our study was a cross-sectional one. To find out more information about patients' mental distress and sleep quality changes during and after hospitalization, future studies may contain the follow-up of patients.

Ethics

Ethics Committee Approval: This study was performed in accordance with the Declaration of Helsinki and was approved by the Muğla Sıtkı Koçman University Human Research Ethics Committee (protocol number: 200179, decision no: 150).

Informed Consent: All patients provided signed informed consent to participate in the study.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: Ö.O.T., Design: Ö.O.T., Data Collection or Processing: Ö.O.T., U.T., F.A., A.F.A., Analysis or Interpretation: Ö.O.T., U.T., S.G., Writing: Ö.O.T.

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Sleep Go Away, I Don't Have Much Time Left to Live: Is Bedtime Procrastination Related to Perceived Time Left in Life?

Uyku Seninle Uğraşamam, Yaşayacak Çok Vaktim Kalmadı: Uykuyu Ertelemek Gelecek Zaman Algısıyla İlişkili mi?

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Abstract

Objective: Sleep insufficiency is a common public health problem associated with various psychological and physical health outcomes. A recently proposed cause for sleep insufficiency is bedtime procrastination. Despite existing research about the concept, its underlying factors are mostly unclear. Considering the theoretical analogy between sleep time and the end of the day, the current study presents an explanation for bedtime procrastination. This study aims to examine the effect of future time perspective on bedtime procrastination and test the mediator role of purpose in life in this association.

Materials and Methods: A cross-sectional survey-based study was conducted with 317 participants. Each participant completed the measures of bedtime procrastination, future time perspective, purpose in life, self-control, circadian energy, and sleep quality.

Results: The analyses revealed that higher future time perspectives predicted lower bedtime procrastination; and purpose in life fully mediated the association. This effect remained significant after controlling the effects of self-control and circadian energy.

Conclusion: The results indicate that when people believe they have enough time in their life, they tend to procrastinate their bedtime less because they have a purpose for their future and focus less on momentary gains.

Keywords: Bedtime procrastination, future time perspective, purpose in life, sleep, sleep time

Öz

Amaç: Uyku problemleri, birçok psikolojik ve fizyolojik sağlık sorununu beraberinde getirmekte ve günden güne yaygınlaşmaktadır. Özellikle son yıllarda uyku problemlerinin sıklıkla araştırılan nedenlerinden biri olarak uyku vaktini erteleme davranışı öne çıkmaktadır. Görece yeni araştırılmaya başlanan bu konu hakkında yürütülmüş birtakım çalışmalar olmasına rağmen bu sorunun nedenlerine dair bilgiler hala belirsizdir. Uyku ve günün sonu arasında kurulmuş kuramsal benzerlik göz önünde bulundurularak bu araştırmada uykuyu erteleme davranışına yeni bir açıklama getirilmeye çalışılmıştır. Bu araştırmanın amacı, gelecek zaman algısının uykuyu erteleme üzerindeki etkisini, hayatın amacı değişkenin aracı rolünü de göz önünde bulundurarak incelemektir.

Gereç ve Yöntem: Kesitsel araştırma yöntemi kullanılarak yürütülmüş olan bu çalışmaya 317 kişi katılmıştır. Her katılımcı uyku vaktini erteleme, gelecek zaman algısı, hayatın amacı, öz-kontrol, biyolojik ritim ve uyku kalitesi ölçeklerini doldurmuştur.

Bulgular: Araştırmanın sonuçları, gelecek zaman algısındaki artışın uyku vaktini ertelemedeki azalmayı yordadığını ve bu ilişkide hayatın amacının aracı rolü olduğunu göstermiştir. Bu anlamlı etki, öz-kontrol ve biyolojik ritim kontrol edildikten sonra da devam etmiştir.

Sonuç: Araştırmanın sonuçlarına göre, insanlar hayatta yaşayacak yeterli vakitlerinin olduğuna inandıklarında kendilerine geleceğe dair hedefler koyarak anlık tatminleri erteliyor olabilir; bunun sonucunda da uykuyu daha az erteliyor olabilirler.

Anahtar Kelimeler: Uykuyu erteleme, gelecek zaman algısı, hayatın amacı, uyku, uyku vakti

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Introduction

A major public health problem of modern days is the lack of sufficient sleep (1,2). Although sleep is critical for daily functioning, as well as for psychological and physical health (3-5), it has been reported that sleep durations of U.S. adults significantly decreased over the years (4). Based on the reports of National Sleep Foundation (6), almost half of the U.S. adults stated that changing their sleep schedules even for an hour affects them both physically and emotionally, yet only 30% and 38% of them followed a regular bedtime routine in weekdays and weekends, respectively.

Most of the studies about sleep psychology focused on sleep insufficiency in individuals with sleep disorders such as insomnia, hypersomnia, or sleep apnea. Yet, sleep insufficiency is also a common and escalating problem for the general population (7). One of the main reasons for insufficient sleep was reported as procrastination of bedtime (8). Bedtime procrastination was defined as the behavior of deliberately postponing bedtime without any accountable external reason (9). According to the study of Kroese et al. (1), 74% of the representative Dutch sample postponed their bedtime at least once a week.

Although it is a major cause of sleep insufficiency, procrastination of sleep is a rather new concept; and thereby, the data about it is very limited (9). Published heretofore literature highlighted its association with several constructs such as circadian chronotypes, i.e., people's genetic preference of morningness (r=0.34) (10) or eveningness (r=-0.39) (11) and aversive bedtime routines like brushing teeth or taking out contact lenses (r=0.31) (8). But the majority of the studies in this area considered bedtime procrastination as a self-control dysfunction, i.e., the inability to resist distractions (9,12). Hence, these studies revealed inconsistent correlations between bedtime procrastination and self-regulation problems ranging from low (r=-0.11) to high (r=-0.52). What confused researchers further was that procrastination behaviors happen when the task is aversive (e.g., doing homework or exercise, etc.), but going to bed is not considered as an aversive activity for many people (1). Therefore, despite existing research about bedtime procrastination, its underlying factors remained mostly unclear (2).

Recent studies revealed that people procrastinate sleep more when their days are filled with obligations since they believe they need that leisure time at night as a daily reward (7,13). Although these studies explained bedtime procrastination again by individuals' difficulty in self-regulation, in the current research, we suggested an alternative explanation for it.

The present study puts forward the hypothesis that bedtime procrastination might be explained by individuals' subjective perception of time. Subjective perception of time, also known as the future time perspective, means how much time people believe they have left to live (14). According to the socioemotional selectivity theory (SST) people's preferences for activities and pursuit of goals depend on their subjective perception of time (15,16). People might perceive their time left in life as limited ("My time is running out") or open-ended ("I have enough time ahead") (14,16). When people believe their time is limited, they tend to search for immediate happiness and experiences at the moment; since their future-oriented goals are perceived as inaccessible (17,18). On the other hand, when people perceive their time as open-ended, they tend to focus on their future-oriented goals and delay current emotional rewards (16).

There has been scarce literature published on the association of future time perspective with health-related behaviors. These studies mainly pointed out that a more future-oriented life promotes healthy practices and less risky behaviors. (19,20). However, bedtime procrastination, as one of the health-related behaviors, has not been investigated in relation to future time perspective, yet. But as SST pointed out, the endings in life (e.g., graduation, relocation, old age) remind people of their remaining time in life (21). Considering this, sleep time might also prime people to think about their remaining time because it is considered as the end of the day. Therefore, it can be proposed that sleep-related behaviors, one being the bedtime procrastination, are also affected by people's subjective perception of time.

The proposed association between bedtime procrastination and future time perspective might be influenced by purpose in life (PIL) because the relation between PIL and future time perspective is well-documented in the literature (e.g., 22). PIL is mainly defined as a central life aim organizing people's goals and behaviors and providing them with a sense of direction in life, thereby making their life more meaningful (23-25). According to Frankl (24), aiming at future means aiming at a goal, and if the future is blocked or perceived as limited, then for those people, life loses its meaning. Therefore, those people are more likely to devote themselves to present-day activities and immediate outcomes (14). On the contrary, when people believe they have a future, they may see their future as an area for new meaning and possibilities (22,24). Even though these people may also live in the present, they are more attuned to their future for new opportunities; and establish more future-oriented goals (22). Since bedtime procrastination is considered as a daily reward for some people, who prioritize present over future (7), this construct is hypothesized to change as a function of future time perspective and PIL.

In light of the information given above, the current study proposes that the behavior of bedtime procrastination is influenced by people's subjective perception of time. Those who believe they do not have much time in life may have no goals for their future and thereby may focus on their immediate happiness and present rewards. On the other hand, those who believe they have enough time in their life may focus on their future and establish a life goal for themselves; and thereby, they may see no importance in procrastinating their bedtime. Thus, the current research hypothesized that (1) higher future time perspective would predict lower bedtime procrastination, and (2) PIL would mediate the relation between future time perspective and bedtime procrastination.

Materials and Methods

Participants

The sample of the current study consisted of 317 participants. They were recruited from the department's subject pool, SONA, which is an online platform enabling university students to participate in studies in return of bonus points for their courses. The details of the demographic characteristics of the participants can be seen in Table 1.

Measures

Bedtime procrastination scale (BPS): BPS was developed by Kroese et al. (9) to assess bedtime habits and procrastination. It includes 9 self-report items. The participants rate these items on a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores on the scale indicate more bedtime procrastination. Sample items are "I easily get distracted by things when I actually would like to go to bed" and "I want to go to bed on time but I just don't". According to explanatory factor analysis, it is a single-factor scale (Eigenvalue=5.57). Higher correlations between sleep outcomes and BPS (r_{range}=0.46-0.61) compared to the correlations between the former and general procrastination (r_{range}=-0.19-0.37) indicate its validity (9). The Turkish adaptation of the scale was carried out by Yılmaz Dinç et al. (26). Confirmatory factor analysis yielded a single factor explaining 60.10% of the total variance. The Cronbach's alpha value of the Turkish version was 0.71. In our current study, the internal consistency of the scale was 0.91.

Future time perspective scale (FTP): Carstensen and Lang (27) developed the FTP to measure people's subjective perception of time with 10 items. The participants rate the items on a 5-point Likert scale ranging from 1 (very untrue) to 5 (very true). Higher scores indicate more extended future time perspective. Sample items include "Many opportunities await me in the future" and "As I get older, I begin to experience time as limited". The internal consistency for the FTP was reported as 0.92 in the original study. The FTP was translated into Turkish by Edwards (28). The Cronbach's alpha coefficient for the Turkish version was 0.90. Its positive correlations with the life orientation test and planful subscale of the attitudes towards the future scale (AFTS); and negative correlation with the anxious subscale of the AFTS indicated construct validity of the Turkish FTP. In our study, the internal consistency reliability coefficient of FTP was 0.86.

Purpose in life test (PILT): The PILT was constructed by Crumbaugh and Maholick (23). It is a two-subscale, 20-item scale, and one of its subscales assesses the level of PIL. Higher score on this subscale means that the person has higher sense of purpose and meaning in life. The items are rated on a 7-point Likert scale. Sample items consisted "Life to me seems: completely routine/always exciting" and "As I view the world in relation to my life, the world: Completely confuses me/its meaningfully with my life". As an indication of discriminant validity, PILT could successfully differentiate psychiatric patients from healthy individuals (29). The PILT was translated into Turkish by Kıraç (30); four original items were discarded from Turkish version of the PILT since psychometric properties of them were insufficient. The Cronbach's alpha coefficient of the Turkish PILT was 0.91 and the split-half reliability value of the scale was 0.92. Explanatory factor analyses showed the Turkish scale has three factors, namely meaning and purpose, quality of life, and freedom. The three-factor structure explained 58.4% of the total variance (30). For the current sample, the internal consistency reliability coefficient of the scale was 0.92.

Brief self control scale (BSCS): The BSCS is a short version of the self control scale developed by Tangney et al. (31). The scale aims to measure "The ability to override or change one's inner responses, as well as to interrupt undesired behavioral tendencies and refrain from acting on them", in other words, self-control (31, p274). The 13 items of the scale are rated on a 5-point Likert scale, from 1 (not at all like me) to 5 (very much like me). A high BSCS score means that the person has high self-control. Sample items are "I refuse things that are bad for me" and "I have a hard time breaking bad habits". The Turkish adaptation of the BSCS was done by Nebioglu et al. (32). The internal consistency of the Turkish form was 0.83, while the test-retest reliability of the scale was 0.88. Negative correlations of BSCS with the impulsivity subscale of The Barratt impulsiveness scale-11 as well as controlling negative body responses and anger management subscales of emotional management skills scale evinced the Turkish BSCS's concurrent validity. In addition, as an indication of discriminant validity, the BSCS could successfully differentiate healthy groups from individuals diagnosed with bipolar disorder (32). As previous studies indicated an association between procrastination and self-control, in the current study, BSCS was utilized to measure

Table 1. Demographic characteristics of the sample

	Frequency/ mean	Percentage (%)/SD
Age	21.78	3.94
Gender		
Female	250	78.86
Male	67	21.13
Marital status		
Single	312	98.42
Married	5	1.57
Children		
Yes	3	0.94
No	314	99.05
Employment		
Yes	23	7.25
No	294	92.74
Socio-economic status		
Very high	3	0.94
High	25	7.88
Middle	243	76.65
Low	39	12.30
Very low	7	2.20

SD: Standard deviation

one of the control variables. For the present sample, the Cronbach's alpha value was 0.84.

The circadian energy scale (CIRENS): The CIRENS was developed by Ottoni et al. (33) to assess chronotypes. The scale has three basic items assessing energy levels at morning, evening, and afternoon (optionally). The participants rate their energy levels on a 5-point scale that ranges from 1 (very low) to 5 (very high). The items of the scale are "In general, how is your energy level in the morning" and "In general, how is your energy level in the evening". One can measure chronotype simply by subtracting the morning energy scores from the evening energy scores. The scores lower than -2 indicate morning type, the scores between -1 and 1 signify neither-type, finally the scores higher than 2 denote evening type. Ottoni et al. (33) found that the CIRENS had 0.70 correlation with the morningness-eveningness scale. Acknowledging the robust relationship between sleep related variables and circadian chronotypes in the literature, in our study, the two items CIRENS was used to determine participants' chronotype and to enter it to the analyses as other control variable.

Pittsburgh sleep quality index (PSQI): Buysse et al. (34) constructed the PSQI to assess sleep characteristics and quality over the past month. PSQI consists of 24 items, and the first 19 are in self-report form. Since the last 5 items are rated by the participants' sleep partner, they may be excluded. Participants are asked to rate these 19 items on a 4-point Likert scale ranging from 0 to 3. A score of 5 and lower from PSQI signals good sleep quality, whereas the scores higher than 5 imply that sleep quality get poorer. Sample items of index included "During the past month, what time have you usually gone to bed at night?" and "During the past month, how would you rate your sleep quality overall?". The original scale has 0.80 and 0.85 values for internal consistency reliability and test-retest reliability (for 28-days interval) respectively. The Cronbach's alpha value of Turkish PSQI was 0.80, while test-retest reliability correlation value was 0.98 (35). In this study the PSQI was used to gather descriptive information about sleep characteristics, patterns, and quality of the participants. For the present sample, the alpha value for PSQI was 0.79.

Procedure

The data used in the present study is a part of a larger dataset. After the ethical approval was obtained from the institutional review board (protocol number: 2018-SOS-034), all instruments were uploaded to a secure online data collection system, and participants were invited to the study via the department's subject pool. Instructions about the study purposes, confidentiality procedures, and their participant rights (refusal to participate or withdrawal from the research) were provided. The questionnaires were presented to participants in a counterbalanced order. The application of the questionnaires took nearly 20 minutes.

Statistical Analysis

All analyses were conducted using SPSS 25. To test the hypotheses that higher future time perspective would predict lower bedtime procrastination and PIL would mediate the relationship between future time perspective and bedtime procrastination, SPSS macro ''indirect'' with bootstrapping procedure based on 10000 bootstrapped resamples was used (36). Future time perspective (independent variable), bedtime procrastination (dependent variable), and PIL (mediating variable) were included in the mediation model. A second model, in which self-control and circadian chronotypes were controlled, was also tested.

Results

The descriptive statistics of sleep duration, sleep latency, and subjective sleep quality are presented in Table 2. The PSQI scores yielded that the average sleep duration of the participants was 7.30 hours [standard deviation (SD)=1.18]. Only 4.73% of the participants reported having less than 5 hours of sleep, and 3.78% of the participants reported having 9-10 hours of sleep. After going to bed, participants were able to fall asleep in 30.30 minutes (SD=25.13) on average. In terms of subjective sleep quality, the majority of the participants reported their sleep quality as very good or fairly good (55.84%). More than a third of the participants (35.65%) reported that they have difficulty to remain awake during daily activities at least once in a week.

Table 2. Descriptives regarding sleep quality

Sleep duration			Sleep latency			Subjective sleep quality			Difficulty to remain awake		
	Frequency	%		Frequency	%		Frequency	%		Frequency	%
<5 hrs	15	4.73	0-15 mins	124	39.11	Very good	16	5.05	Not during the past month	106	33.44
5-6 hrs	45	14.19	15-30 mins	108	34.06	Fairly good	161	50.79	Less than once a week	98	30.91
6-7 hrs	86	27.12	30-60 mins	62	19.55	Fairly bad	126	39.75	Once or twice a week	80	25.24
7-8 hrs	122	38.48	>60 mins	23	7.25	Very bad	14	4.41	Three or more times week	33	10.41
8-9 hrs	37	11.67	-	-	-	-	-	-	-	-	-
9-10 hrs	4	1.26	-	-	-	-	-	-	-	-	-
>10 hrs	8	2.52	-	-	-	-	-	-	-	-	-

Descriptive statistics for and Pearson correlation coefficients among age, circadian energy and self-control, future time perspective, PIL and bedtime are presented in Table 3. The correlations between the main study variables were in expected directions. There was a small to medium negative correlation between future time perspective and bedtime procrastination (r=-0.26, p<0.001). In other words, the participants who believed they still have much time in life tended to procrastinate bedtime less. Moreover, future time perspective and PIL had medium to large positive correlation (r=0.57, p<0.001), meaning that the individuals who believed they have much time in life were also likely to find their life more purposeful.

Mediation Analysis

The results of the mediation analysis can be seen in Table 4. The direct effect of future time perspective on bedtime procrastination was not significant [b=-0.05, boot SE=0.05, p=0.34, 95% confidence interval (CI) (-0.14, 0.05)]. However, the bootstrapped unstandardized indirect effect was significant [b=-0.15, boot SE=0.03, p<0.001, 95% CI [(-0.21, -0.10)]. Hence, PIL fully mediated the future time perspective-bedtime procrastination association. The overall model was significant [F (2, 314)=28.51, p<0.001], and it accounted for 15% of the variance in bedtime procrastination. The relations in the mediation model are illustrated in Figure 1. After controlling for age, self-control and circadian energy, PIL still fully mediated the relation between future time perspective and bedtime procrastination [The direct effect: b=-0.08, boot SE=0.05, p=0.07, 95% CI (-0.17, -0.01)].

Discussion

The current study aimed to provide an alternative explanation to the phenomenon of bedtime procrastination, which is generally conceptualized as a self-regulation dysfunction (e.g. 37). Considering that general procrastination behaviors provide some benefits to the person since it includes ceasing to do the aversive task (1), for some individuals, there might also be a possible gain in this type of procrastination behavior. Following this idea, the current study investigated the effect of future time perspective on bedtime procrastination, and the mediator role of PIL in this association. The proposed hypotheses were confirmed by the findings. Accordingly, the total effect of future time perspective on bedtime procrastination was significant. In other words, having higher future time perspective predicted lower bedtime procrastination behaviors. This finding suggested that people who believe they have enough time in life are less likely to procrastinate their bedtime. On the other hand, people who believed they have limited time tended to procrastinate more, perhaps to enjoy their remaining time to its fullest and not to waste it with sleeping. Moreover, PIL fully mediated the effect of future time perspective on bedtime procrastination. This indirect effect remained significant even after controlling self-control and circadian energy. This result indicated that the relation between future time perspective and bedtime procrastination could be better explained via the concept of PIL. As it was stated in the literature, when individuals believe they have a future, they are able to construct a purpose and follow the path leading to that purpose (22,24). For these people, the future goals are prioritized over their present (14). According to MacKenzie and Baumeister (38), PIL represents people's goals for the future; and people engage and organize their present-day activities to reach these goals in the future, even if those

Table 3. Descriptives for and correlations among the study variables

Variables	1	2	3	4	5	M	SD	Min	Max
1) Age	-					21.78	3.94	18.00	58.00
2) Circadian energy	-0.08					0.61	1.56	-4.00	4.00
3) Self control	0.26***	-0.20***				41.07	8.15	17.00	63.00
4) Future time perspective	-0.06	-0.01	0.25***			46.11	9.72	15.00	70.00
5) Purpose in life	0.20***	-0.16**	0.51***	0.57***		91.19	19.16	39.00	135.00
6) Bedtime procrastination	-0.11*	0.36***	-0.35***	-0.26***	-0.39***	29.41	7.46	9.00	45.00
*p<0.05, **p<0.01, ***p<0.001, SD: Standard deviation									

Table 4. The mediator role of purpose in life in the relationship between future time perspective and bedtime procrastination

	B	t	p	95% CI	
				Lower	Upper
Mediation path a	1.11	12.14	<0.001	0.93	1.29
Mediation path b	-0.20	-4.79	<0.001	-0.28	-0.12
Total effect, path c (future time perspective on bedtime procrastination with purpose in life)	-0.20	-4.79	<0.001	-0.28	-0.12
Direct effect, path c' (future time perspective on bedtime procrastination)	-0.05	-0.95	0.34	-0.14	0.05
Indirect effect bootstrapped 95% CI	-0.15	-	-	-0.21	-0.09
Model R^2=0.15, F (2, 314)=28.51, p<0.001, CI: Confidence interval					

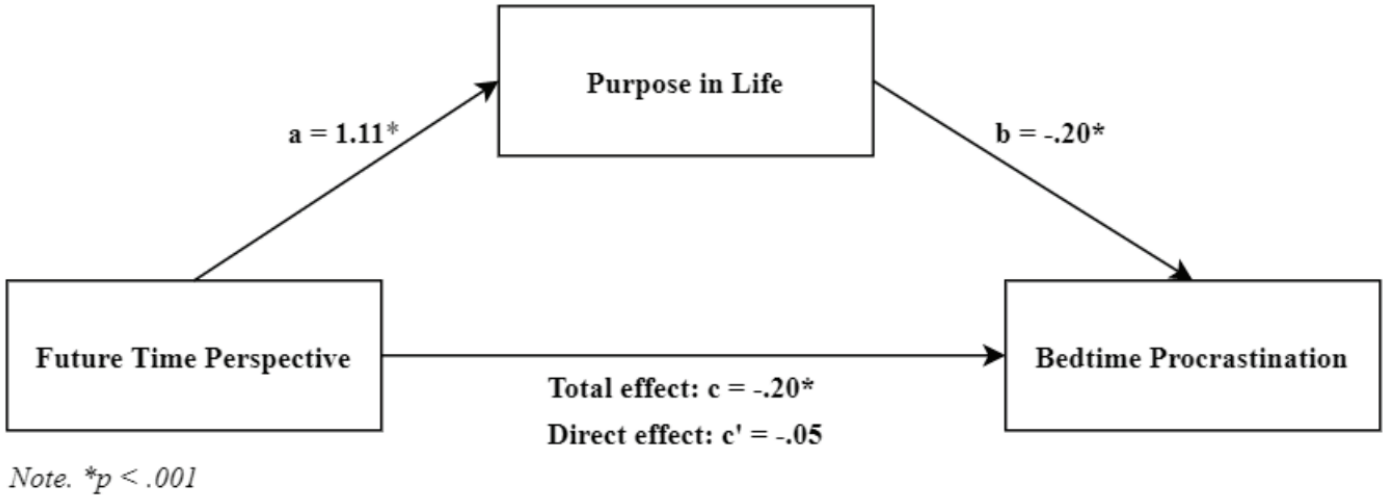

Figure 1. The regression coefficient (unstandardized) fot the relationship between future time perspective and bedtime procrastination in mediation of purpose in life

activities are unpleasant. Therefore, it can be argued that our present-day activities are closely related to future outcomes. In terms of bedtime procrastination, it might be suggested that those people, who think that they have plenty of time ahead and are able to establish a purpose, perceive their future time just as rewarding or even more rewarding than their present time. Thereby, these individuals are likely to focus on the upcoming days, which will lead them to their purpose and might see procrastination of sleep unnecessary. On the other hand, when people believe their time in life is limited, they seem not to be able to create a future goal or plan, i.e., the purpose for their life, and thus, might prefer to engage in present-day activities to gain emotional satisfaction at least for that moment.

The present researchers' attempt to explain bedtime procrastination through time perception and PIL provided an existential approach to conceptualize the concept of bedtime procrastination further. In many previous studies, sleep behaviors were investigated in relation to several existential constructs such as death anxiety (10), meaning in life (39), and existential well-being (40). Although sleep is generally formulated from the medical or behavioral perspectives, the importance of studying sleep from the perspective of existential psychology is re-emphasized with the present findings. Considering the vital importance of sleep for human life, understanding its meaning from a broader perspective seems crucial.

Study Limitations

Despite its contributions, the present study is not without its limitations. First, due to its cross-sectional nature, the present findings do not imply any causality between future time perspective and bedtime procrastination. Second, most of the current participants were female, and the mean age of the sample was 21.78. Since age (14) and PIL (41) are crucial factors impacting on future time perspective, further studies with a more representative sample should be conducted.

Conclusion

Overall, this was an exploratory study aiming to examine the relationship between subjective perception of time and bedtime procrastination, and the mediator role of PIL in this relation. These findings offered several new explanations for the recently investigated concept of bedtime procrastination. Mainly, these results suggest that bedtime procrastination is not simply a self-regulatory dysfunction, but it may be perceived as a behavior that is related to our perceived time left in time and our our purpose in life. It is expected that further studies will expand these findings, and especially qualitative studies could be valuable in terms of clearly highlighting the motives, particularly the existential motives, of people who tend to procrastinate their bedtime.

Ethics

Ethics Committee Approval: The ethical approval of this study was obtained from the Middle East Technical University, Human Subject Ethics Committee (protocol number: 2018-SOS-034).
Informed Consent: Informed consent was approved by all the participants through Qualtrics Online Survey Software.
Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Design: D.O., K.K.T., M.Ç., Ö.B., Data Collection and Processing: D.O., K.K.T., M.Ç., Analysis and Interpretation: D.O., K.K.T., M.Ç., Ö.B., Literature Search: D.O., K.K.T., M.Ç., Writing: D.O., K.K.T., M.Ç., Ö.B.
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The Relationship Between Stress Levels, Sleep Quality, and Oral Health-related Quality of Life in Turkish University Students with Self-reported Bruxism

Bruksizmli Türk Üniversite Öğrencilerinde Stres Düzeyleri, Uyku Kaliteleri ve Ağız Sağlığına İlişkin Yaşam Kaliteleri Arasındaki İlişki

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Abstract

Objective: This study aimed to investigate the relationship between sleep quality, stress levels, and oral health-related quality of life of university students with self-reported sleep/awake bruxism in Turkey.

Materials and Methods: Four anonymous questionnaires [Self-reported bruxism, perceived stress scale (PSS), Pittsburgh sleep quality index (PSQI), and oral health impact profile-14 [(OHIP-14)] were administered to 310 university student volunteers that were randomly selected from the various provinces of Turkey. The participants were required to respond independently to the questionnaires at home and were encouraged to contact the authors for further assistance if needed.

Results: Among the study participants, 56.8% were from the school of dentistry and 43.2% from other departments. Of all the participants, 29% had self-reported awake bruxism and 42.3% had self-reported sleep bruxism. A positive correlation was found between the PSS and OHIP-14 results (23.5%) and between the PSQI and PSS (24.6%) results in the students with self-reported awake bruxism (p=0.235, p=0.246; p<0.05). A positive correlation was found between the PSS and OHIP-14 results (23.1%) and between the PSQI and PSS (29.6%) results in the students with self-reported sleep bruxism (p=0.231, p=0.296; p<0.05).

Conclusion: Self-reported awake or sleep bruxism was found to be associated with higher stress levels and sleep disturbances and weaker oral health-related quality of life in university students.

Keywords: Bruxism, stress, sleep quality

Öz

Amaç: Bu çalışmanın amacı, Türkiye'de gece/gündüz bruksizmi olan üniversite öğrencilerinde uyku kalitesi, stres düzeyi ve ağız sağlığı ile ilgili yaşam kalitesi arasındaki ilişkiyi değerlendirmektir.

Gereç ve Yöntem: Türkiye'nin çeşitli illerinden rastgele seçilen 310 gönüllü üniversite öğrencisine dört farklı anket [self-reported bruksizm, algılanan stres ölçeği (PSS), Pittsburgh uyku kalitesi indeksi (PUKİ) ve ağız sağlığı etki profili-14 (OHIP-14)] dağıtıldı. Katılımcılardan anketleri evde bağımsız olarak doldurmaları istendi ve gerekirse daha fazla yardım için araştırmacılarla iletişime geçmeleri istendi.

Bulgular: Katılımcıların %56,8'i diş hekimliği fakültesinde, %43,2'si diğer bölümlerde öğrenciydi. Öğrencilerin %29'unda gündüz bruksizmi ve %42,3'ünde gece bruksizmi vardı. Gündüz bruksizmi olan öğrencilerde PSS ile OHIP-14 arasında (%23,5) ve PUKİ ile PSS arasında (%24,6) pozitif korelasyon bulundu (p=0,235, p=0,246; p<0,05). Gece bruksizmi olan öğrencilerde PSS ile OHIP-14 arasında (%23,1) ve PUKİ ile PSS arasında (%29,6) pozitif korelasyon tespit edildi (p=0,231, p=0,296; p<0,05).

Sonuç: Çalışmamıza göre bruksizmli üniversite öğrencilerinde daha yüksek stres seviyeleri ve uyku bozuklukları ile birlikte ağız sağlığına ilişkin yaşam kalitesinin daha zayıf olduğu görülmektedir.

Anahtar Kelimeler: Bruksizm, stres, uyku kalitesi

Introduction

Bruxism is explained as the actions of clenching the teeth, supporting the jaws without real tooth contact and grinding the teeth while awake or asleep (1). American Academy of Sleep Medicine redefined sleep bruxism as ''A movement disorder that occurs during sleep'' in 2005, after the recognition of sleep bruxism as parasomnia (2). The etiology of sleep bruxism sophisticated, past studies are associated with environmental causes such as occlusal interventions and problematic anatomy, but current studies indicate that it is related to the central

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nervous system (3). Risk factors associated with bruxism include habits such as smoking and alcohol use, disorders in neurotransmitters, stress and trauma (4). ''Awake bruxism'' is defined as the clenching of teeth and jaws when the individual is aware of the action of performance during the day, while awake (5). Daytime bruxism is defined as clenching of teeth and jaws rather than teeth grinding. The pathophysiology is not clearly known, but studies reveal that stress and anxiety are among serious risk factors (5,6).

Although no direct relationship can be established, psychological factors are thought to have an important role in quality of life, affecting daily activities (7) and personal perception of oral health (8). Regarding the effect of bruxism on life quality of different populations, the 14-item oral health impact profile (OHIP-14) is the most widely used and validated measure (8-10). It evaluates health via a multi-faceted approach; from biological, psychological, social and cultural perspectives (10).

The main method to understand an individuals' perception of diseases and the impact of the disease on the individual is detection of oral health related quality of life (OHRQoL). This detection enables healthcare professionals to focus on specific aspects of the illness and provide effective support to the patient in the course of their care (11,12).

Bruxism is a sleep-related movement disorder, as increasing anxiety, stress-related repetitive arousal during sleep and poor sleep quality (13) are the main reasons. These factors alter wakefulness and the initiation and maintenance of sleep via chemical mediators that activate catecolamine release (14). Alteration of sleep patterns are reported to exacerbate pain in bruxism patients (15). Recent studies reveal that bruxism is significantly associated with chronic anxiety (16) and individuals reporting bruxism are twice as stressful as non-bruxism cases (13,17).

There are studies on the relationship between bruxism and stress among university students (18-20). When stress studies on university students are evaluated in general, stress sources include academic and personal reasons, as well as the environmental and economic conditions. One of the signs of stress is the grinding and clenching of the teeth that occurs without a functional requirement (18-20).

It is important to investigate information on parafunctional habits and psychological states of university students to find possible causes of bruxism and to detail preventive measures. This study aims to compared the OHRQoL, perceived stress scale (PSS) and Pittsburgh sleep index (PSI) in individuals with and without awake and sleep bruxism in Turkish university students. Moreover, it aims to identify the correlation between PSS, PSI and OHIP-14 scores both the presence of the awake and sleep bruxism. The null hypothesis investigated was that stress levels, sleep quality, and OHRQoL would not present with significantly different outcomes in terms of bruxism.

Materials and Methods

Four different questionnaires [Self-reported bruxism, PSS, Pittsburgh sleep quality index (PSQI) and OHIP-14] were distributed to volunteer university students randomly selected from various provinces from Turkey. Participants were asked to complete the anonymous questionnaires independently at home, and were encouraged to contact the authors for further assistance when needed. In the study, a survey was collected from 317 dental students. As a result of the survey; 7 (2.2%) students with systemic diseases were excluded from the study. The study was conducted with 310 students of all ages, male or female. All subjects (n=310) who agreed to participate in the study answered the completed questionnaires within 3 days. A prior power analysis was performed and it was found that 310 samples produces a two-sided 95% confidence interval with a width equal to 0.220 when the sample correlation is 0.050.

Ethics approval was provided by İstanbul Medipol University Ethics Committee (10840098-604.01.01-E.15516, May 2020). This research adhered to the principles of the Declaration of Helsinki.

Self-reported Bruxism

The questions used in the present study to evaluate self-reported awake and sleep bruxism were constructed according to the recommendations of Pintado et al. (21) and Lavigne et al. (22) The diagnosis of awake bruxism depended solely on the respondent's awareness (''Have you ever been aware of clenching or grinding your teeth during wakefulness in the past 6 months?'' yes/no). Subjects were defined as suffering from awake bruxism if they responded affirmatively to this question. Sleep bruxism was evaluated by a questionnaire based on the diagnostic criteria of the American Academy of Sleep Medicine (2005) (2). Turkish version of self-reported bruxism is not available in the literature; the authors have translated it into Turkish.The questionnaire refers to events during the past 6 months. Respondents were scored as suffering from active sleep bruxism if their answer was positive to question 1 and/or question 2, in addition to at least one positive answer to a symptom listed in question 3 (6).

PSS

The level of emotional stress was measured by using the PSS, developed by Cohen et al. (23). This questionnaire consists of 14 items and examines stressful feelings and thoughts which the respondent experienced during the past month. The respondent is asked to rate with what frequency he/she felt/thought them on a scale of four ranging from ''never'' to ''very often'', with a resulting total score ranging between 0 and 56 (a higher score indicating a higher level of emotional stress). This study used the validated version for Turkish, which showed good psychometrics (intraclass coefficient =0.87 and Cronbach's alpha =0.84) (24).

PSQI

The PSQI includes seven components; subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medications, and daytime dysfunction (25). The Turkish-language version of the PSQI was used in the present study (26). The score for each subgroup ranges from 0 to 3.

The sum of these scores yields one global score of subjective sleep quality (range: 0-21). The sleep quality of those with a total score of ≤5 is considered "good" and those >5 is "poor".

OHIP-14

This self-report questionnaire consists of 14 questions divided into seven domains: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The items are rated on a 5-point scale, ranging from 0 (never) to 4 (always), and the final score is the sum of all individual items. Accordingly, the OHIP-14 scores range from 0 to 56, where the higher scores indicated poor quality of life related to oral health. This study used the validated version for Turkish, which found reliable (Cronbach alpha: 0.74), repeatable (r=0.932), valid and intelligible (96.2%) (27).

Statistical Analysis

SPPS 25 (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.) statistical package program was used to evaluate the data. Descriptive statistics (mean, standard deviation, median value, minimum, maximum, number and percentile) were given for categorical and continuous variables in the study. In addition, the homogeneity of variances, which is one of the prerequisites of parametric tests, was checked with Levene test. Normality assumption was examined with Shapiro-Wilks test. Differences between two groups were evaluated by Student's t-test in case parametric test met the prerequisites; if it was not provided, Mann-Whitney U test was used for comparison of three or more groups. One-Way Analysis of Variance for three or more group comparisons and Tukey HSD test from multiple comparison tests; when not provided, Kruskal-Wallis and Bonferroni-Dunn test from multiple comparison tests were used. The relationship of two continuous variables was evaluated with Pearson Correlation Coefficient and Spearman Correlation Coefficient if the parametric test did not meet the prerequisites. Relationships of categorical variables were analyzed using Fisher's Exact test and chi-square test. In cases where expected frequencies are less than 20%, an evaluation has been made with Monte Carlo Simulation Method to include these frequencies in the analysis. A level of $p<0.05$ and $p<0.01$ was considered statistically significant.

Results

Table 1 displays demographic characteristics of the students. Participant distribution according to schools displayed 56.8% study in the department of dentistry and 43.2% of them study in other departments. Statistical results revealed no difference among the scales, according to the department of the students (OHIP p=0.086, PSS p=0.088, PSQI p=0.642; p>0.05). The age range of 83.2% of the participants was 18-25. Evaluation of the scales by age groups revealed that OHIP-14 scale shows a significant difference according to the ages of the students (p=0.019, p<0.05). There is no significant difference between participants ≤18 and between the ages of 18-25, it is seen that the scores of students ≥25 are significantly higher than the other age groups. PSS and PSI scores do not differ according to the age groups of the students (p>0.05). Comparison of scales according to marital status revealed no significance (OHIP p=0.555, PSS p=0.482, PSQI p=0.388; p>0.05). The PSI score was found significantly higher in smoking participants (p=0.001, p<0.05) (Table 2). 68.7% of the students participating in the study are women and 31.3% are men. Gender relationship of scales reveal that OHIP-14 and PSS scales are higher in female students than males (OHIP p=0.001, PSS p=0.015; p<0.05). PSI scores do not differ among genders (p=0.129, p>0.05) (Table 3).

Self-reported awake bruxism is 29% and self-reported sleep bruxism is 42.3%. Both awake bruxism and sleep bruxism were reported more frequently by women than by men: 5.2% vs 3.9% for awake bruxism and 18.6% vs 13.9% for sleep bruxism. Table 4 reveals that OHIP-14 scale has significant difference according to the status of self-reported awake bruxism. Here is a statistically significant difference in the physical pain, psychological discomfort, psychological disability and social disability scales, which are the sub-scales of OHIP-14 (p=0.040, p=0.001, p=0.001, p=0.027; p<0.05). PSI scores reveal statistically significant difference according

Table 1. Demographic characteristics of the students

		n	(%)
Department	Dentistry	176	56.8
	Other	134	43.2
	Total	310	100.0
Age	<18	2	0.6
	18-25	258	83.2
	>25	50	16.1
	Total	310	100.0
Gender	Female	213	68.7
	Male	97	31.3
	Total	310	100.0
Marital status	Single	293	94.5
	Couple	16	5.2
	Total	309	99.7
Cigarette	No	213	68.7
	Yes	61	19.7
	Not now	36	11.6
	Total	310	100.0
Alcohol	No	195	62.9
	Yes	101	32.6
	Not now	14	4.5
	Total	310	100.0
Self-reported awake bruxism	No	220	71.0
	Yes	90	29.0
	Total	310	100.0
Self-reported sleep bruxism	No	179	57.7
	Yes	131	42.3
	Total	310	100.0

to self-reported awake bruxism status. In addition, there is a statistically significant difference in the sub-scales of the PSI, subjective sleep quality, sleep disorder, and use of sleep medicine (p=0.021, p=0.004, p=0.014; p<0.05).

Table 5 reveals, the OHIP-14 scale shows a statistically significant difference according to the self-reported sleep bruxism status. There is also statistically significant difference in OHIP-14 subscales of physical pain, psychological discomfort, physical disability, psychological disability, social disability and handikap (p=0.001, p=0.001, p=0.001, p=0.010, p=0.007, p=0.015; p<0.05). The PSS reveals statistically significant difference according to self-reported sleep bruxism status (p=0.025; p<0.05). PSI shows statistically significant difference according to self-reported sleep bruxism status and significant difference in the sub-scales of PSI, subjective sleep quality, sleep duration, sleep disorders, use of sleeping drugs, and daytime dysfunction (p=0.009, p=0.005, p=0.001, p=0.018, p=0.001; p<0.05).

As shown in Table 6, positive correlation of 23.5% between PSS and OHIP-14 and 24.6% between PSI and PSS in students with

Table 2. Comparison of scales according to students' department, age, alcohol and smoking use

	Scale	Department	Scale points ($\bar{x}$ ± SD)	Test	p	η^2
Department	**OHIP-14**	Dentistry	11.31±7.79	-1.717	0.086	0.69
		Other	14.22±9.83			
	PSS	Dentistry	30.61±5.69	-1.705	0.088	0.72
		Other	30.81±7.30			
	PSI	Dentistry	7.32±2.35	-0.464	0.642	0.73
		Other	6.72±2.23			
Age	**OHIP-14**	<18	4.50±0.7a	7.931	0.019$^{\psi}$*	0.76
		18-25	12.01±8.41^{a}			
		>25	15.76±10.33^{b}			
	PSS	<18	31.00±9.90	5.104	0.078	0.71
		18-25	30.35±6.51			
		>25	32.46±5.70			
	PSI	<18	4.00±0.00	3.789	0.150	0.47
		18-25	7.09±2.36			
		>25	7.06±2.03			
Cigarette	**OHIP-14**	No	12.04±8.48	3.577	0.167	0.69
		Yes	12.92±9.22			
		Not now	15.11±9.96			
	PSS	No	30.84±6.23	0.467	0.792	0.43
		Yes	30.33±6.19			
		Not now	30.50±7.96			
	PSI	No	6.73±2.31^{a}	18.041	0.001$^{\psi}$**	0.79
		Yes	8.07±2.25^{b}			
		Not now	7.31±1.91^{ab}			
Alcohol	**OHIP-14**	No	12.55±9.07	5.033	0.081	0.66
		Yes	11.81±7.76			
		Not now	18.29±11.16			
	PSS	No	30.03±7.04^{a}	6.460	0.040$^{\psi}$*	0.78
		Yes	31.86±5.28^{a}			
		Not now	31.57±3.18^{ab}			
	PSI	No	6.84±2.33^{a}	11.840	0.003$^{\psi}$**	0.78
		Yes	7.62±2.23^{b}			
		Not now	6.14±1.92^{a}			

**p<0.01, *p<0.05, $^{\psi}$Kruskal-Wallis test, ^{ab}: Different letters in the same column represent the statistically significant difference (p<0.05), $^{\eta 2}$: One-Way Analysis of Variance, OHIP-14: Oral health impact profile-14, PSS: Perceived stress scale, PSI: Pittsburgh sleep index, SD: Standard deviation

Table 3. Comparison of scales according to students' gender					
Scale	**Gender**	**Scale points ($\bar{x}$ ± SD)**	**Test**	**p**	**η^2**
OHIP-14	Woman	13.67±8.70	-3.865	0.001$^{\psi}$**	
	Man	10.15±8.69			0.81
PSS	Woman	31.22±6.49	-2.424	0.015$^{\psi}$*	0.83
	Man	29.55±6.15			
PSI	Woman	7.17±2.18	-1.517	0.129	0.22
	Man	6.81±2.58			

**p<0.01, *p<0.05, η^2: Student t-test, $^{\psi}$Mann-Whitney U test, OHIP-14: Oral health impact profile-14, PSS: Perceived stress scale, PSI: Pittsburgh sleep index, SD: Standard deviaton

self-reported awake bruxism are displayed (p=0.235, p=0.246; p<0.05). There is statistically significant positive correlation of 23.1% between PSS and OHIP-14 and 29.6% between PSI and PSS in students with self-reported sleep bruxism (p=0.231, p=0.296; p<0.05).

Discussion

Stress plays a role in sleep and awake bruxism. Past studies support, participants who reported bruxism claimed to have higher levels of emotional stress than those without bruxism (3,28). As a limitation of this study, the use of self-reported bruxism scale, which is an assessment tool based only on the reports of individuals, can be evaluated in the diagnosis of

Table 4. Comparison of OHIP-14, perceived stress scale, Pittsburgh sleep index and subscales of these scales according to self-reported awake bruxism status						
Scale		**Self-reported awake bruxism**	**Scale points ($\bar{x}$ ± SD)**	**Test**	**p**	**η^2**
OHIP-14	Total test	No	11.50±8.87	-4.176	0.001$^{\psi}$**	0.83
		Yes	15.17±8.24			
	Functional limitation	No	0.54±1.17	-1.885	0.059	0.71
		Yes	0.84±1.59			
	Physical pain	No	2.50±2.02	-2.051	0.040$^{\psi}$*	0.84
		Yes	2.99±1.97			
	Psychological discomfort	No	3.62±1.78	-5.409	0.001$^{\psi}$**	0.88
		Yes	4.92±1.71			
	Physical disability	No	1.28±1.68	-1.504	0.133	0.44
		Yes	1.53±1.73			
	Psychological disability	No	1.45±1.72	-3.387	0.001$^{\psi}$**	0.88
		Yes	2.11±1.84			
	Social disability	No	1.12±1.62	-2.205	0.027$^{\psi}$*	0.89
		Yes	1.63±1.99			
	Handicap	No	0.99±1.45	-1.646	0.100	0.14
		Yes	1.13±1.33			
PSS	Total test	No	30.17±6.83	-1.831	0.067	0.42
		Yes	31.99±5.12			
PSI	Total test	No	6.85±2.36	-2.682	0.007$^{\psi}$**	0.44
		Yes	7.58±2.12			
	Subjective sleep quality	No	1.56±0.69	-2.310	0.021$^{\psi}$*	0.69
		Yes	1.37±0.68			
	Sleep latency	No	1.35±1.08	-1.053	0.292	0.82
		Yes	1.50±1.02			
	Sleep duration	No	0.88±1.06	-1.836	0.066	0.66
		Yes	1.12±1.11			
	Habitual sleep efficacy	No	0.11±0.49	-0.393	0.694	0.44
		Yes	0.07±0.33			
	Sleep disturbances	No	1.48±0.65	-2.849	0.004$^{\psi}$**	0.64
		Yes	1.72±0.65			
	Sleeping medications	No	0.06±0.32	-2.470	0.014$^{\psi}$*	0.34
		Yes	0.19±0.54			
	Daytime dysfunction	No	1.40±0.99	-1.612	0.107	0.47
		Yes	1.61±0.93			

**p<0.01, *p<0.05, η^2: Student t-test, $^{\psi}$Mann-Whitney U test, OHIP-14: Oral health impact profile-14, PSS: Perceived stress scale, PSI: Pittsburgh sleep index, SD: Standard deviaton

Table 5. Comparison of OHIP-14, perceived stress scale, Pittsburgh sleep index and subscales of these scales according to self-reported sleep bruxism status

Scale		Self-reported sleep bruxism	Scale points ($\bar{x}$ ± SD)	Test	p	η^2
OHIP-14	Total test	No	11.02±8.83	-4.399	0.001$^{\psi}$**	0.87
		Yes	14.69±8.42			
	Functional limitation	No	0.57±1.28	-1.137	0.255	0.65
		Yes	0.70±1.35			
	Physical pain	No	2.34±2.02	-3.442	0.001$^{\psi}$**	0.55
		Yes	3.07±1.93			
	Psychological discomfort	No	3.65±1.91	-3.953	0.001$^{\psi}$**	0.88
		Yes	4.48±1.67			
	Physical disability	No	1.11±1.63	-3.568	0.001$^{\psi}$**	0.91
		Yes	1.69±1.73			
	Psychological disability	No	1.40±1.61	-2.570	0.010$^{\psi}$**	0.82
		Yes	1.97±1.95			
	Social disability	No	1.06±1.63	-2.710	0.007$^{\psi}$**	0.41
		Yes	1.56±1.87			
	Handicap	No	0.89±1.37	-2.442	0.015$^{\psi}$*	0.87
		Yes	1.21±1.46			
PSS	Total test	No	30.06±6.63	-2.241	0.025$^{\psi}$*	0.71
		Yes	31.56±6.05			
PSI	Total test	No	6.54±2.36	-4.806	0.001$^{\psi}$**	0.76
		Yes	7.77±2.06			
	Subjective sleep quality	No	1.59±0.68	-2.607	0.009$^{\psi}$**	0.91
		Yes	1.38±0.68			
	Sleep latency	No	1.30±1.08	-1.895	0.058	0.77
		Yes	1.53±1.02			
	Sleep duration	No	0.80±1.03	-2.786	0.005$^{\psi}$**	0.81
		Yes	1.15±1.12			
	Habitual sleep efficacy	No	0.09±0.41	-0.137	0.891	0.84
		Yes	0.11±0.50			
	Sleep disturbances	No	1.44±0.65	-3.428	0.001$^{\psi}$**	0.83
		Yes	1.70±0.64			
	Sleeping medications	No	0.05±0.27	-2.374	0.018$^{\psi}$**	0.83
		Yes	0.17±0.53			
	Daytime dysfunction	No	1.27±1.00	-4.036	0.001$^{\psi}$**	0.77
		Yes	1.73±0.87			

**p<0.01, *p<0.05, η^2: Student t-test, $^{\psi}$Mann-Whitney U test, OHIP-14: Oral health impact profile-14, PSS: Perceived stress scale, PSI: Pittsburgh sleep index, SD: Standard deviation

Table 6. Correlation between scales both in the awake and sleep bruxism individuals

			OHIP-14	Perceived stress scale
Self-reported awake bruxism	Perceived stress scale	r	0.235**	
		p	0.001	
	Pittsburgh sleep index	r	0.005	0.246**
		p	0.942	0.001
Self-reported sleep bruxism	Perceived stress scale	r	0.231**	
		p	0.002	
	Pittsburgh sleep index	r	-0.001	0.296**
		p	0.987	0.000

**p<0.01, *p<0.05, OHIP-14: Oral health impact profile-14

bruxism. However, similar to studies conducted with clinical diagnoses, the stress levels of students with self-reported sleep bruxism are higher than those without bruxism (28). Another limitation of this study is that the prevalence of bruxism in our sample group was higher than in the general population. The reason for this limitation can be considered as the previous limitation itself, that is, determining the diagnosis of bruxism with a single assessment tool.

Another issue discussed is that emotional stress impairs sleep quality (21), its effect on the transition between deep sleep and lighter sleep, and bruxism occurs as a result of these microstimulations (6,29). Although sleep quality values are close to each other between individuals with and without awake or sleep bruxism, a second complaint accompanying individuals with particularly high stress levels is poor sleep quality (29).

In general, the presence of high stress levels of students appears to be consistent with the previous literature (30). Therefore, the first null hypothesis could be rejected. Recent literature on correlation of stress and bruxism reveals that stress induces neuromuscular changes in the mouth and jaw in university students, affecting the overall prevalence of temporomandibular disorders (31). In terms of studies involving university setting, an association between bruxism and stress has been demonstrated (32) and the literature reports an increase in the self-reported incidence of nocturnal bruxism among university students over the past decade (20).

The existence of gender effect on stress for college students is also consistent with our study: most studies reported higher stress for female students (33,34). Previous studies have shown that bruxism is also prevalent among females in the general population (35) and students have also shown a higher prevalence among females, as we confirmed in our study (36,37). Also, studies related to stress levels and gender (38) reveal that women report that they perceive higher levels of stress than men (6).

Age-related OHRQoL in the literature shows more negative outcomes with increasing age (9,17). The findings in our study also support worse OHRQoL in individuals over 25 years of age. Assessment of sleep quality in the bruksoman population may help to better characterize these patients and, moreover, addressing sleep disturbances may reference other therapeutic approaches to improve sleep quality. Mean PSQI scores ranged from 6.08 (24) to 10.8 (39) in recent studies suggesting poor sleep quality in patients with sleep bruxism. Poor sleep quality of university students with both drowsy and awake bruxism in our study supports the literature (40). Considering that bruxers have high sensitivity to psychological stress (41) and psycho-physiological insomnia is characterized by response to stress (42), the loss of sleep quality among bruxers in our study may be explained.

Data of self-reported college students with bruxism present worse OHRQoL and sleep quality. The total scores of OHIP-14 reveal that the bruxers perceived their OHRQoL more negatively than controls (19,43). In this study, we adopted the OHIP-14, the most widely used questionnaire to access OHRQoL (44). When the OHIP is evaluated in seven areas (functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and disability), the high scores of all subscales, thus poor OHRQoL, indicate those with self-reported bruxism. A study in orthodontic treatment patients also supports the relationship between bruxism and poor OHRQoL; those with bruxism have higher symptoms of anxiety and depression and weaker OHRQoL (45).

Statistically higher scores were found in the areas of psychological discomfort (confident and nervous), psychological inadequacy (difficult to relax and shame) and physical pain (pain and discomfort) among participants, compared to other groups; suggesting greater tendency for psychosocial, emotional, and pain disorders. It was stated that psychological factors may play a role in the estimated etiology of bruxism (46), and results associated with stress also supported this situation (14). Moreover, bruxers had a high consumption of tobacco and alcohol, which is supported by the current literature. Bertazzo-Silveira et al. (47) show in their study that the probability for bruxism increases 2 times for alcohol drinkers and more than 2 times for smokers.

Conclusion

Self-reported awake or sleep bruxism is associated with higher stress levels, sleep disturbances, and weaker OHRQoL in university students. Other factors (alcohol, caffeine and tobacco use) that are consistently associated with bruxism that may affect OHRQoL should also be investigated.

Ethics

Ethics Committee Approval: Ethics approval was provided by İstanbul Medipol University Ethics Committee (10840098-604.01.01-E.15516, May 2020). This research adhered to the principles of the Declaration of Helsinki.

Informed Consent: Informed consent form was obtained from all participants included in our study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: H.E.Ö., Design: S.G., H.E.Ö., K.C.A., Data Collection or Processing: H.E.Ö., S.G., K.C.A., Analysis or Interpretation: H.E.Ö., S.G., K.C.A., Literature Search: H.E.Ö., S.G., K.C.A., Writing: H.E.Ö.

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Çocukların Bilgisayar Oyun Bağımlılıkları: Kronotip Uyku

Computer Game Addictions of Children: Chronotype Sleep

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Öz

Amaç: Günümüzde teknolojik gelişmelerle beraber özellikle çocuk ve ergenlerde bilgisayar kullanımı hızla yaygınlaşmıştır. Bu çalışma, çocukların bilgisayar oyun bağımlılıklarının kronotip uyku durumlarına etkisini incelemek amacı ile yapıldı.

Gereç ve Yöntem: Çalışmamız 1 Ocak-31 Mayıs 2020 tarihleri arasında 109 ebeveyn ve çocuk üzerinde yapıldı. Araştırmada ''çocuk bilgi formu'', ''çocuklar için bilgisayar oyun bağımlılığı ölçeği'' ve ''çocukluk dönemi kronotip anketi'' kullanıldı. Veriler, bilgisayar ortamında yüzdelik dağılım, ortalama, t-testi ve korelasyon ile değerlendirildi.

Bulgular: Çalışma kapsamına alınan çocukların %50,5'inin kız olduğu ve yaş ortalamalarının 9,20±1,45 olduğu belirlendi. Çocukların %94,4'ünün bilgisayar oyun bağımlılığı için riskli grupta oldukları ve %2,8'inin sabahçı tip, %8,3'ünün ara tip, %89'unun ise akşamcı tip kronotipe sahip olduğu belirlendi. Annelerin çalışma durumları ile bilgisayar oyun ölçeğinin bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme alt boyutunun, çocuğun bilgisayar/tablette zaman geçirme durumları ile bilgisayar oyun ölçeğinin bilgisayar oyunu oynamaktan dolayı görevleri aksatma alt boyutunun puanları arasında önemli fark olduğu belirlendi ($p<0,05$). Çocukların uyku toplam puanları ile bilgisayar oyun bağımlılığının bazı alt boyutları ve toplam puanları arasında pozitif ilişki olduğu belirlendi.

Sonuç: Araştırmamızda çocukların büyük bir kısmının akşamcı tip kronotipe sahip oldukları ve bilgisayar oyun bağımlılığı için riskli grupta oldukları belirlenmiştir. Bu doğrultuda çocukların bilgisayar kullanımları ile uyku gereksinimlerine göre eğitim ve danışmanlık vermesi önerilmektedir.

Anahtar Kelimeler: Çocuk, kronotip uyku, bilgisayar oyun bağımlılığı, hemşire

Abstract

Objective: Nowadays, the use of computers has become widespread with technological developments, especially among children. Thus, this study aimed to examine the effects of children's computer game addiction on their chronotype sleep states.

Materials and Methods: The research was conducted in 109 parents and children between January 1, 2020 and May 31, 2020, using the ''child information form'', ''computer game addiction scale for children'', and ''children's chronotype questionnaire''. Data were evaluated in a computer environment using percentage distribution, mean, t-test, and correlation.

Results: Of children included in the study, 50.5% were females and the average age was 9.20±1.45 years. Additionally, 94.4% were in the risk group for computer game addiction; 2.8% had morning, 8.3% had intermediate, and 89% had evening type chronotype. There was a significant difference between mothers' working status and imagining the computer game and associating it with real-life subscale scores of the computer game scale, as well as between children spending time on the computer/tablet and skipping tasks due to computer game subscale scores of the computer game scale ($p<0.05$). A positive correlation was found between total sleep scores of children and some sub-dimensions and total scores of computer game addiction.

Conclusion: Our study determined that most children had the evening type chronotype and they were in the risk group for computer game addiction.

Keywords: Child, chronotype sleep, computer game addiction, nursing

Giriş

Oyun geçmişten günümüze kültürel birikimle birlikte gelişen, çocuğun fiziksel, zihinsel sosyal gelişimlerini destekleyen, dış dünyayla uyumunu ve iletişimini kolaylaştıran, eğlenmek amacıyla yapılan bir çeşit öğrenme şeklidir (1-4). Çocuklar oyun aracılığıyla, problem çözme, sosyal ve duygusal becerilerini geliştirme, çevresini keşfetme ve seçim yapma yeteneği kazanabilmektedir (4-6).

Günümüzde teknolojinin gelişmesi ile beraber gelişim dönemleri ve ihtiyaçlarına göre çocukların oyun algıları değişmiş, sokaklarda oynanan geleneksel oyunların yerini, evlerde veya internet kafelerde oynanan video oyunları ve bilgisayar başında

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gerçekleştirilen sanal etkinlikler almıştır (4,6,7). İlgili alanda tüm dünyada bilgisayar ve internet kullanımının yaygınlaşması, çocukların küçük yaşlarda bilgisayarlarla tanışmasına ve bilgisayar başında geçirilen zamanlarının artmasına neden olduğu belirtilmiştir (4). Ayrıca bazı çalışmalarda çocukların bilgisayarları sıklıkla bilgi edinme ve araştırma amacının yanı sıra eğlenmek ve boş zamanı değerlendirmek için kullandıkları belirtilmiş (4,7,8) ve bu durumun çocuklarda çeşitli olumlu ve olumsuz bazı etkiler doğurduğu ifade edilmiştir (4).

Konu ile ilgili olarak Güllü ve ark. (9) bilgisayar oyunlarının el-göz koordinasyonunu sağlama, hayal etme becerisini ve yeteneklerini geliştirme, neden sonuç ilişkisi kurabilme gibi faydalarının olduğunu belirtmiştir. Kim ve Smith (10) de oyunların çocukların problem çözme, karar verme becerilerini geliştirebildiklerini göstermiştir. Ancak bazı çalışmalarda kontrolsüz bir şekilde uzun süre oynanan oyunların çocuklarda aşırı sinirlilik, şiddete meyili olma, sosyal izolasyan, depresyon ve yalnızlık gibi sorunlara neden olabileceği ifade edilmiştir (11,12). Benzer şekilde Mustafaoğlu ve ark. (13) oyun oynamanın çocuklarda, anksiyete, depresyon, agresif davranışlar sergileme gibi ruhsal sorunlarla birlikte kas-iskelet sistemi problemleri, gözlerde kızarıklık, kuruluk, ağrı olma ve uyku kalitesinde bozulma, gibi fiziksel sağlık sorunlara neden olabildiğini belirtmiştir.

Uyku, bireylerin günlük yaşamını, iyilik durumunu etkileyen, büyüme ve gelişmesini sağlayan sağlığın önemli bir parçasıdır (14). Bu nedenle çocukların gelişimlerini tamamlayabilmeleri için yeterli düzeyde uyumaları ve dinlenmeleri gerekmektedir (15). Çocukluk döneminde başlayan uyku sorunlarının davranışsal, bilişsel ve duygusal sağlık sorunlarıyla birlikte düzensiz uyuma ve uyanma rutinlerinden kaynaklandığı bilinmektedir (16). Literatürde çocuklarda uyku süresinin kültürlerine geleneklerine ve biyolojik faktörlere bağlı olduğu bildirilmiştir (17). Ancak uyku süresi, zamanı ve yoğunluğu homeostatik ve sirkadiyen bir sürecin etkileşimi ile belirlenebilmektedir (18). Sirkadiyen süreç, biyolojik belirteçler (uyku-uyanıklık döngüsü, vücut ısısı, kortizol vs.) kullanılarak ölçülmektedir. Kronotip ise sirkadiyen ritmin bireysel farklılıklarını ifade etmektedir (19). Kronotip sabahçıl tip (erken yatan, erken uyanan bireyler), ara tip (hem sabahçıl tip hem akşamcıl tip bireyler) akşamcıl tip (geç yatıp, geç uyanan bireyler) olmak üzere üç kategoride incelenmektedir. İlgili alanda bireylerin gelişim süreçlerinde kronotiplerinin değişebileceği, çocukluk dönemlerinde daha çok sabahçıl tip gözlenirken adölesan dönemlerinde akşamcıl tip kronotipe sahip oldukları belirtilmiştir (18,20). Aynı zamanda biyolojik faktörlerle birlikte ebeveynler, okul yaşantısı, sosyal hayat ve çalışma hayatı gibi çeşitli sosyal ve çevresel faktörlerin kronotipik değişikliklere neden olabileceği ifade edilmiştir (21,22). Bu doğrultuda araştırmamız çocukların bilgisayar oyun bağımlılıklarının kronotip uyku durumlarına etkisini incelemek amacı ile yapılmıştır.

Araştırmanın Soruları

1. Çocukların bilgisayar oyun bağımlılık oranları ne düzeydedir?
2. Çocukların bilgisayar oyun bağımlılık düzeyleri ve kronotip uykuları ilişkili midir?

Gereç ve Yöntemler

Araştırmanın türü: Araştırma tanımlayıcı tipte bir araştırmadır.

Araştırmanın Evren ve Örneklemi

Araştırmanın evrenini 1 Ocak 2021-31 Mayıs 2021 tarihleri arasında İstanbul'da bir okuldaki ilköğretim öğrencileri oluşturmuştur. Araştırmamızda İstanbul çok kültürlü bir bölge olması nedeniyle amaçlı örnekleme yöntemi kullanıldı. Örneklem seçiminde benzer kültürel özellik taşıması amacıyla bir bölgedeki tek bir okul seçildi. Evrenin tamamına ulaşılması hedeflenmiş ve öğrenciler ve ebeveynlerin tamamı ile görüşme sağlanmıştır. Çalışmaya katılmayı kabul ederek görüşme sonrası dönüş yapan, okuduğunu anlayabilen ve sorulara cevap verebilen 109 ebeveyn ve çocukları araştırmamızın örneklemini oluşturmuştur. Veriler Google Form programı aracılığıyla hazırlanan online anket formu ile Ocak-Mayıs 2021 tarihleri arasında elde edilmiştir. Veri toplama öncesinde okul yönetimi, öğretmenler bilgilendirilmiştir. Araştırmaya katılmayı kabul eden çocuk ve ebeveynler bilgisayar oyun bağımlılığı ölçeğinin çocuklar, Kronotip uyku anketinin ise ebeveynler tarafından doldurulacağı konusunda bilgilendirilmiştir. Daha sonra çocuk ve ebeveynlere araştırmacılar tarafından online anket formu kısa mesaj yoluyla gönderilmiştir. Yeterli verinin toplanabilmesi için ilk gönderimden iki hafta sonra anket yinelenmiştir. Araştırmaya katılan çocuk ve ebeveynlerden online ortamda aydınlatılmış onam alındıktan sonra veriler toplanmaya başlanmıştır. Anketin sonlanması için bir zaman kısıtlaması yapılmamıştır.

Veri Toplama Araçları

Verilerin toplanmasında ''çocuk bilgi formu'', ''çocuklar için bilgisayar oyun bağımlılığı ölçeği'' ve ''çocukluk dönemi kronotip anketi (ÇDKA)'' kullanıldı.

Çocuk Bilgi Formu

Araştırmacılar tarafından hazırlanan bu form çocuk ve ebeveynlerin sosyo-demografik özelliklerini (yaş, cinsiyet, sosyo-ekonomik durum, evde bilgisayar olma, çocukların bilgisayarda harcadıklar zaman vs.) içeren sorulardan oluşmaktadır.

Çocuklar için Bilgisayar Oyun Bağımlılığı Ölçeği

Horzum ve ark. (23) tarafından 2008 yılında geliştirilmiş olup 5'li likert tipinde 21 maddeden oluşmaktadır. Ölçek bilgisayarda oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma, bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme, bilgisayar oyunu oynamaktan dolayı görevleri aksatma, bilgisayar oyunu oynamayı başka etkinliklere tercih etme alt boyutları bulunmaktadır. Ölçekten alınabilecek puanlar 21 ile 105 arasındadır. Ölçeğin Türkçe geçerlilik ve güvenirliliği Horzum ve ark. (23) tarafından 2008 yılında yapılmış ve Cronbach Alfa katsayısı 0,85 olarak belirlenmiştir. Araştırmamız için ölçeğin Cronbach Alfa iç tutarlık katsayısı 0,89 bulunmuştur.

ÇDKA

Werner ve ark. (24) tarafından 2009'da geliştirilen ölçek 27 maddeden oluşmaktadır. Ölçekte toplam puan 23 ve altı için sabahçı (erken yatan, erken uyanan bireyler), 24-32 arası için

ara form (hem sabahçıl tip hem akşamcıl tip bireyler), 33 ve daha üstü için akşamcı (geç yatıp, geç uyanan bireyler) olarak değerlendirilmektedir. Ölçeğin Türkçe geçerlilik ve güvenirliliği Dursun ve ark. (25) tarafından 2015 yılında yapılmış ve Cronbach Alfa katsayısı 0,65 olarak belirlenmiştir. Araştırmamız için ölçeğin Cronbach Alfa iç tutarlık katsayısı 0,74 bulunmuştur.

Araştırmanın Etik Yönü

Çalışmaya başlamadan önce İnönü Üniversitesi Sağlık Bilimleri Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu'ndan (karar no: 2019/3-25) etik kurul izni alındı. Hem çocuklar hem de ebeveynlerinden bilgilendirilmiş onam alındı.

İstatistiksel Analiz

Araştırma sonucunda elde edilen verilerin değerlendirilmesi SPSS (Statistical Package For Social Sciences) 25.0 paket programı ile elektronik ortamda yapıldı. Tanımlayıcı istatistikler içinin yüzdelik dağılım ve ortalama, verilerin normal dağılıma uyup uymadığı belirlemek için Kolmogorov-Smirnov testi kullanıldı. Çocukların bazı değişkenlere göre bilgisayar oyun bağımlılık düzeylerini karşılaştırmak için karşılaştırmalı istatistiklerden bağımsız gruplar t-testi, değişkenler arasında ilişkiyi belirlemek için korelasyon analizi kullanıldı. İstatistiksel anlamlılık için p-değeri 0,05 olarak belirlendi.

Bulgular

Araştırmamıza katılan çocukların %50,5'inin kız ve yaş ortalamalarının 9,20±1,45 olduğu belirlenmiştir. Çocukların %78,8'inin evinde bilgisayar/tablet olduğu, çocukların %95,5'inin bilgisayarda/tablette vakit geçirdiği, bilgisayar/tableti günlük kullanma sürelerinin ortalama 4,64±4,57 saat olduğu, %42,2'sinin oyun oynamak için bilgisayarı kullandıkları ve %94,4'ünün bilgisayar oyun bağımlılığı için riskli grupta olduğu bulunmuştur (Tablo 1).

Çocukların ortalama uyku sürelerinin 9,98±1,02 saat olduğu ve kronotiplerine göre değerlendirildiğinde %2,8'inin sabahçı tip, %8,3'ünün ara tip, %89'unun ise akşamcı tipe sahip olduğu belirlenmiştir.

Bazı demografik özelliklere göre bilgisayar oyun bağımlılığı ölçeği, alt boyutları ve kronotip uyku ölçeği karşılaştırılmıştır. Çocukların cinsiyetlerine göre erkek çocukların bilgisayar oyun bağımlılığı ölçeğinin toplam puanının, bilgisayardan oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma, bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme alt boyutu puanlarının daha yüksek ve aralarında anlamlı fark olduğu bulunmuştur ($p<0,05$). Anneleri çalışan çocukların, bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme alt boyutu, bilgisayara/tablette zaman geçiren çocukların ise, bilgisayar oyunu oynamaktan dolayı görevleri aksatma alt boyutu puanlarının daha yüksek ve aralarındaki farkın önemli olduğu belirlenmiştir ($p<0,05$) (Tablo 2).

Çalışmamızda kronotip uyku ölçeği ve bilgisayar oyun bağımlılığı ölçeği arasındaki ilişki incelenmiştir. Çocukların bilgisayar/tablette günlük kullanma süresi ile bilgisayar oyun ölçeğinin alt boyutları ve toplam puanları arasında pozitif ilişki olduğu tespit edilmiştir. Aynı zamanda çocukların uyku toplam puanları ile bilgisayarda oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma, bilgisayar oyunu oynamaktan dolayı görevleri aksatma ve bilgisayar oyun bağımlılığı ölçeğinin toplam puanları arasında pozitif ilişki olduğu belirlenmiştir (Tablo 3).

Tartışma

Günümüzde teknolojik gelişmelerle beraber özellikle çocuk ve ergenlerde bilgisayar kullanımı ve bilgisayar aracılığıyla oynanan sanal oyunlar hızla yaygınlaşmaktadır (2,11). Araştırmamızın bulguları değerlendirildiğinde çocukların büyük bir kısmının bilgisayar/tablette vakit geçirdiği ve oyun bağımlılığı için riskli grupta oldukları belirlenmiştir. İlgili alanda ilköğretim ve ortaokul öğrencileri ile yapılan farklı çalışmalarda öğrencilerin problemli bilgisayar kullanıcısı oldukları ve oyun bağımlılık düzeylerinin yüksek olduğu bildirilmiştir (5,9). Bu doğrultuda sağlık profesyonellerinin çocukların oyun bağımlılıklarının ve bağımlılık durumlarının olumsuz etkilerini, ebeveyn ve öğretmenlerle paylaşması, eğitimler vererek desteklemeleri gerektiği düşünülmektedir.

Araştırmamızda annelerin çalışma durumlarının bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme puanlarını etkilediği belirlenmiştir. İlgili alanda annelerin çalışma durumlarının oyun bağımlılığını etkileyen çalışmaya rastlanmamakla birlikte Gökçearslan ve Durakoğlu (26) yaptıkları araştırmada ebeveynlerin öğrenim düzeyi arttıkça oyun bağımlılığı düzeylerinin arttığını göstermiştir. Benzer şekilde Şahin ve Tuğrul (27) anne öğrenim düzeylerinin çocukların oyun bağımlılıkları düzeylerini etkilediğini bildirmiştir. Anneleri çalışan çocukların bilgisayar oyun bağımlılığı için daha riskli oldukları ve çocukların bağımlılık durumlarını etkileyebilecek annelere yönelik faktörlerin belirlenmesinin önemli olabileceği söylenebilir.

Tablo 1. Çocukların sosyo-demografik özellikleri

		n	%
Cinsiyet	Kız	55	50,5
	Erkek	54	49,5
Evde bilgisayar/tablet bulunma durumu	Evet	86	78,9
	Hayır	23	21,1
Bilgisayar/tablette vakit geçirme durumu	Evet	105	95,5
	Hayır	4	4,5
Bilgisayar/tableti kullanma amacı	Ders çalışmak	2	1,8
	Oyun oynamak	46	42,2
	Facebook/instagram	3	2,8
	Ders çalışmak ve oyun oynamak	50	45,9
	Diğer	8	7,3
	Ort ± SS		
Yaş ortalaması	9,20±1,45		
Bilgisayar/tablet kullanma süresi	4,64±4,57		
Uyku süresi	9,98±1,02		

SS: Standart sapma

Bilgisayar ve internet kullanımının yaygınlaşması, çocukların oyun oynama alanını sokaktan alıp evin içine taşımış ve çocuklar için bilgisayar ortamında oyun oynamak boş zamanlarını değerlendirmeye yönelik bir etkinlik haline gelmiştir (27). Yapılan çalışmalar çocukların bilgisayar oyunlarına harcadıkları süre arttıkça bağımlılık düzeylerinin de arttığını göstermiştir (5). Çalışmamızda da çocukların bilgisayar/tablette günlük kullanma süresi ile bilgisayar oyun ölçeğinin alt boyutları ve toplam puanları arasında pozitif ilişki olduğu tespit edilmiş ve literatürle benzerlik göstermiştir. Çocukların teknoloji kullanımlarının ebeveyn gözetiminde olmasının yanı sıra hem çocuk hem ebeveynlerinin, uzun süreli teknoloji kullanımının olumsuz etkileri hakkında eğitilmesi gerektiği düşünülmektedir.

Çocukluk döneminde uyku sorunları, geçici sorunlardan kalıcı olanlara kadar değişebilmekte ve her dört çocuktan birinde bu sorunlar ortaya çıkabilmektedir (28). Çocukların uyku alışkanlıklarını etkileyen ve çocuklarda uyku sorunlarına neden olabilen biyolojik ve psikolojik faktörlerin yanı sıra çevresel faktörler de bulunmaktadır (29). Literatürde teknoloji kullanımının çocukların uykularını olumsuz yönde etkilediğini gösteren çalışmalar bulunmaktadır (13,30). Çocukluk döneminde yatak odasında teknolojik cihaz bulundurmanın ve şiddet içeren oyunlar sonrası çocukların uykuya dalmakta güçlük çektiği uyku sürelerini olumsuz yönde etkileyebileceği belirtilmiştir (31,32). Araştırmamızda da çocukların bilgisayarda oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma, bilgisayar oyunu oynamaktan dolayı görevleri aksatma ve bilgisayar oyun bağımlılığı ölçeğinin toplam puanları arasında pozitif ilişki olduğu belirlenmiştir. Çocukların uzun süre teknoloji kullanımlarının beraberinde çeşitli uyku sorunlarına neden olabildiği ve bu durumun çocukların uyku saatlerinde değişikliklere yol açabileceği söylenebilir.

Çalışmamızda çocukların büyük bir kısmının akşamcı tip kronotip uykuya sahip olduğu bulunmuştur. Konu ile ilgili olarak ilgili alanda çocuklarda biyolojik faktörlerle birlikte çeşitli sosyal ve çevresel faktörlerin kronotipik değişikliklere neden olabileceği ve çocukların daha çok sabahçı tip (erken yatıp erken uyanan) kronotipe sahip olduğu ifade edilmiştir (18-22). Çalışmamıza katılan çocukların kronotiplerini etkileyebilecek

Tablo 2. Bazı demografik özellikler ile bilgisayar oyun ölçeğinin alt boyutlarının karşılaştırılması

		Bilgisayardan oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma	Bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme	Bilgisayar oyunu oynamaktan dolayı görevleri aksatma	Bilgisayar oyunu oynamayı başka etkinliklere tercih etme	Oyun toplam	Kronotip uyku toplam
Çocuğun cinsiyeti	**Erkek**	29,94±8,99	8,72±3,63	5,40±2,08	8,81±3,25	52,88±14,90	2,18±0,585
	Kadın	23,98±7,44	7,05±2,73	4,90±1,83	7,83±3,11	43,78±12,49	2,12±0,610
	t	**3,741**	**4,664**	0,598	0,472	**2,499**	0,013
	p	**0,000**	**0,008**	0,189	0,112	**0,001**	0,614
Annenin çalışma durumu	**Evet**	28,70±8,94	9,32±4,30	5,51±2,09	8,70±3,48	52,25±17,32	2,19±0,542
	Hayır	26,23±8,61	7,30±2,63	5,01±1,91	8,16±3,10	46,71±12,88	2,14±0,618
	t	0,100	**16,72**	0,205	0,318	4,99	0,313
	p	0,752	**0,000**	0,652	0,574	0,027	0,680
Çocuğun bilgisayar/ tablette zaman geçirme durumu	**Evet**	27,20±8,72	7,97±3,31	5,23±1,96	8,40±3,16	48,82±14,28	2,14±0,595
	Hayır	19,75±6,18	5,50±1,91	3,00±0,00	6,00±4,00	34,25±11,84	2,50±0,577
	t	1,267	1,219	**7,688**	0,266	0,474	0,088
	p	0,263	0,272	**0,007**	0,607	0,493	0,241

Tablo 3. Bilgisayar oyun ölçeğinin alt boyutları ile bilgisayar/tableti günlük kullanma süresi ve kronotip uyku ölçeği arasındaki ilişki

		Bilgisayar/tableti günlük kullanma süresi	Kronotip uyku toplam
Bilgisayardan oyun oynamaktan vazgeçmeme ve engellendiğinde rahatsız olma	**r**	**0,567****	0,220*
	p	**0,000**	0,022
Bilgisayar oyununu hayalinde yaşatma ve gerçek hayatla ilişkilendirme	**r**	**0,441****	033
	p	**0,001**	737
Bilgisayar oyunu oynamaktan dolayı görevleri aksatma	**r**	**0,375****	**268****
	p	**0,005**	**0,005**
Bilgisayar oyunu oynamayı başka etkinliklere tercih etme	**r**	0,231	0,088
	p	0,090	0,363
Oyun toplam	**r**	**0,543****	**0,197***
	p	**0,000**	**0,040**

r: Pearson korelasyon katsayısı, *: 0,05 düzeyinde anlamlılık, **: 0,01 düzeyinde anlamlılık

farklı faktörlerin bu durumu etkileyebileceği düşünülmektedir. Bu doğrultuda çocukların kronotiplerini etkileyebilecek faktörlerin belirlenmesinin önemli olabileceği söylenebilir.

Çalışmanın Kısıtlılıkları

Araştırmamızın sınırlılığını çalışmamızın benzer kültürel özellik taşıması amacıyla bir bölgedeki tek bir okulda yapılmasıdır. Ancak geniş çaplı araştırmalarla tüm il genelinde yapılması önemli olabilir.

Sonuç

Araştırmamızda çocukların büyük bir kısmını akşamcı tip kronotipe sahip olduğu ve bilgisayar oyun bağımlılığı için riskli grupta oldukları belirlenmiştir. Ayrıca çocuklar için bilgisayar/tablette geçirdikleri süre ve oyun bağımlılık düzeylerinin, kronotip uykularını etkileyebileceği saptanmıştır. Çocuklarda teknoloji kullanımının uyku şekliyle değerlendirilmesi gerektiği beklendik bir sonuçtur ve hemşirelerin çocukların oyun ve oyun bağımlılığı durumlarını değerlendirmesi önemlidir. Ayrıca çocukların büyüme ve gelişmesinde önemli rolleri olan uyku ile ilgili olarak çocukların uykularını etkileyebilecek faktörlerin belirlenmesi gerekmektedir. Bu doğrultuda farklı çalışmalarla çocukların kronotip uykularını etkileyebilecek farklı değişkenlerin incelenmesi ve hem çocuk, hem ebeveynlere oyun bağımlılıkları ile ilgili eğitim ve danışmanlık vermesi önerilmektedir.

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Hasta Onayı: Hem çocuklar hem de ebeveynlerinden bilgilendirilmiş onam alındı.
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Ergenlerde Dijital Oyun Bağımlılığı ve Uyku Kalitesi Arasındaki İlişkinin İncelenmesi

Investigating the Relationship Between Digital Game Addiction and Sleep Quality in Adolescents

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Öz

Amaç: Bu çalışmanın amacı ergenlerin dijital oyun bağımlılığı ile uyku kalitesini araştırmak ve aralarındaki ilişkiyi incelemektir.

Gereç ve Yöntem: Tanımlayıcı tipte olan bu çalışma, Doğu Karadeniz Bölgesi'nde bir ilçe merkezinde bulunan üç lisede öğrenim gören ve araştırmayı kabul eden 312 lise öğrencisi ile yapılmıştır. Araştırma verileri, tanıtıcı bilgi formu, dijital oyun bağımlılığı ölçeği ve Pittsburgh uyku kalitesi indeksi kullanılarak toplanmıştır.

Bulgular: Araştırmaya alınan ergenlerin yaş ortalaması 15,99±0,85 idi. Çalışmaya katılan ergenlerin %78,5'inin bilgisayar, cep telefonu, tablet ya da oyun salonlarında dijital oyun oynadığı saptandı. Araştırmada ergenlerin dijital oyun bağımlılığı ölçeği ortalama puanı 12,46±5.57 idi. Öğrencilerin %16,3'ü oyun bağımlısı olarak bulundu. Pittsburgh uyku kalitesi indeksi ortalama puanı 4,72±2,53 olup, puan aralığı 0-13 idi. Uyku kalitesi kötü olanların oranı %34,9 idi.

Sonuç: Dijital oyun bağımlılığı ölçeği ve Pittsburgh uyku kalitesi indeksi puanları arasında pozitif yönlü, düşük düzey, istatistiksel olarak anlamlı bir ilişki olduğu sonucuna ulaşılmıştır (r=0,157, p≤0,001). Ergenlerin dijital oyun bağımlılığı puanları arttıkça uyku kalitesi puanları da yükselmektedir. Ergenlerin oyun bağımlılığı ve uyku ile ilgili problemleri onların fiziksel ve psikolojik sağlığını, akademik başarısını olumsuz yönde etkileyebilir. Ergenler dijital teknolojiyi kullanırken, yeterli denetim ve koruyucu önlemlerin alınması problemlerin oluşmasını azaltabilir.

Anahtar Kelimeler: Bağımlılık, dijital oyun, ergen, uyku kalitesi

Abstract

Objective: This study aimed to assess the digital game addiction and sleep quality in adolescents and examine the relationship between them.

Materials and Methods: This descriptive study was conducted with 312 students from three high schools located in a district center in the Eastern Black Sea Region, who agreed to participate in the study. Data were collected using the descriptive information form, the digital game addiction scale, and the Pittsburgh sleep quality index.

Results: The mean age of the participants was 15.99±0.85 years. Of the participants, 78.5% played digital games on computers, mobile phones, tablets, or game rooms. The mean score of the participants on the digital game addiction scale was 12.46±5.57; 16.3% were game addicts. The Pittsburgh sleep quality index mean score was 4.72±2.53, with a score range of 0-13; 34.9% had poor sleep quality.

Conclusion: In conclusion, a positive, low-level, statistically significant relationship was found between the digital game addiction scale and Pittsburgh sleep quality index scores (r=0.157, p≤0.001). As the digital game addiction scores increase in adolescents, their sleep quality scores also increase. Game addiction and sleep-related problems in adolescents can negatively affect their physical and psychological health and academic success. Adequate supervision and protective measures are required to reduce the problems faced by adolescents when using digital technology.

Keywords: Addiction, digital game, adolescent, sleep quality

Giriş

Gelişen teknolojinin insan hayatında birçok temel yaşam alanını şekillendirdiği yadsınamaz bir gerçek haline gelmiştir. Teknoloji ilerledikçe özellikle ergenlerin oyun alışkanlıklarının değiştiği ve zamanlarını, dikkatlerini giderek daha çok dijital oyunlara verdikleri görülmektedir (1). Dijital ortamda oynanan çevrimiçi ve çevrimdışı oyunlar, sosyalleşme, beceri geliştirme, problem çözme, sorumluluk ve değerler eğitimi gibi birçok konuda çocuğun gelişimine katkıda bulunur. Ancak, kontrolsüz kullanımları dijital oyun bağımlılığı için bir risk oluşturmaktadır (2).

Gelişen teknoloji ile hayatımıza giren ve yaygınlığı gün geçtikçe artan davranış bağımlılıklardan biri olan dijital oyun bağımlılığı, çocuklar tarafından sürekli oyun oynamanın yanı sıra oyunu gerçek hayatla ilişkilendirmeleri, gerçek hayattaki sorumluluklarını ihmal etmeleri ve oyunu yapılması gereken öncelikli işler gibi görmeleri olarak tanımlanmaktadır (3,4). Ergen bireyler arasında oyun bağımlılığı prevelansının %2-15

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arasında değiştiği yapılan çalışmalarda görülmektedir (5-8). Türkiye'de ergenler arasında oyun bağımlılığı yaygınlığının %28,8 olduğu bulunmuştur (3).

Bireyin oyun oynama nedenleri arasında psikolojik veya kişilerarası faktörlerden can sıkıntısı, yalnızlık, düşük benlik saygısı, düşmanlık, dürtüsellik, öz kontrol ve motivasyon eksikliği yer almaktadır. Bunun yanında eğlence, rekabet, başka bir etkinliğin olmaması, sosyalleşme, hayal ortamı oluşturma, bulunulan zaman ve mekandan kaçma gibi nedenler de sıralanabilir (9). Kontrolsüz ve uzun zaman oynanan dijital oyunlar çocuk ve ergenlerin uyku alışkanlıklarının değişmesine, olumsuz alışkanlıklar kazanmalarına neden olmaktadır (7,10). Yapılan çalışmalar ergenlerin uyku ihtiyaçlarının yeterli düzeyde ve yeterli kalitede karşılanamamasında dijital oyunlar oynama, bilgisayar, akıllı telefon, tablet ve televizyon izleme alışkanlıkları gibi çevresel nedenlerin önemli yeri olduğu belirtilmektedir (11). Çocuk ve ergenlerde, uykuya dalmadan önceki dijital ekran maruziyeti bireylerde az uykuya, uyku kalitesinin bozulmasına sebep olmaktadır (12). Yetersiz ve kalitesiz uyku çocuk ve ergenlerin fiziksel, psikolojik, sosyal ve bilişsel gelişimlerinde sorunlara neden olmaktadır (13). Fiziksel büyümenin hızlandığı ergenlik döneminde uyku, fiziksel ve akademik performansı iyileştirmede temel faktördür (14,15).

Bu çalışmanın amacı ergenlerin dijital oyun bağımlılığı, uyku kalitesi düzeylerini araştırmak ve aralarındaki ilişkiyi incelemektir.

Araştırma Soruları

1. Ergenlerin dijital oyun bağımlılığı düzeyleri nelerdir?
2. Ergenlerin uyku kalitesi nasıldır?
3. Ergenlerin oyun bağımlılıkları ile uyku kaliteleri arasında ne tür ilişki vardır?

Gereç ve Yöntemler

Araştırma Evren ve Örneklemi

Çalışma nicel, tanımlayıcı ve kesitsel niteliktedir. Araştırmanın evrenini Milli Eğitim Bakanlığı'na bağlı Doğu Karadeniz Bölgesi'ndeki bir ilçe merkezindeki lise öğrencileri (n=1,397) oluşturmaktadır. Bu araştırmada sonuç ölçütü kategorik olduğu için örneklem hacminin hesaplanmasında $n= (N*t^2*p*q)/[d2*(N-1)+t^2*p*q]$ formülünden yararlanılmıştır. Formül için n=1,397, p=0,5, q=0,5, t=1,96, d=0,05 alınmış minimum örneklem büyüklüğü 302 kişi olarak hesaplanmıştır. Araştırmada veri toplama 312 kişi ile tamamlanmıştır. Veri toplamak için ilçede bulunan altı lise arasından olasılıklı örneklem yöntem kapsamında basit rastgele yöntemle liseler belirlenmiştir. Seçilen üç liseden katılımcılara ulaşılmıştır.

Araştırmaya Dahil Edilme Kriterleri

Seçilen liselerin 9, 10, 11 ve 12. sınıflarına kayıtlı öğrencilerin;
- Kronik hastalığı,
- Nörolojik hastalıkları ve
- Psikiyatrik hastalıkları olmayan,
- Türkçe konuşup anlayabilen, iletişim engeli bulunmayan,
- Çalışmaya katılmaya gönüllü ve velilerinden onam alınmış olan

öğrenciler araştırma kapsamına alınmıştır.

Verilerin Toplanması

Çalışma verileri 10.05.2019-30.05.2019 tarihleri arasında toplandı. Araştırmaya dahil edilme kriterlerini karşılayan öğrencilere araştırma hakkında bilgi verilerek, yazılı ve sözlü onamları alındı. Sınıfta yüz yüze görüşme yöntemi ile uygulanan anket formları, ders başlamadan 15 dakika içinde uygulanmıştır.

Veri Toplama Araçları

Araştırmada veri toplama aracı olarak, araştırmacılar tarafından geliştirilmiş olan "tanıtıcı bilgi formu" ile "dijital oyun bağımlılığı ölçeği" (DOBÖ) ve "Pittsburgh uyku kalitesi indeksi (PUKİ)" kullanılmıştır.

Tanıtıcı Bilgi Formu

Ergenlerin demografik bilgilerini (cinsiyet, yaş, sınıf düzeyi, internet kullanım ve oyun oynama düzeyi vb.) öğrenmek amacıyla tanıtıcı bilgi formu hazırlanmıştır.

DOBÖ

Ölçek Lemmens et al. (16) tarafından ergenlerin sorunlu dijital oyun davranışlarını belirlemek amacıyla geliştirilmiştir. Ölçek DOBÖ-21'in daha kısa, 7 maddelik bir versiyonudur. Yalçın Irmak ve Erdoğan (17), ölçeğin Türkçe geçerlilik ve güvenilirlik çalışmasını 12-18 yaş arası ergenler arasında gerçekleştirmiştir. Ölçekten elde edilen puanlar 7 ile 35 arasında değişmektedir. Politetik tanıya göre yedi maddenin en az dördüne üç (bazen) ve üzerinde puan veriyorsa oyun bağımlısı olarak tanımlanmıştır. Ölçekten alınan toplam puan arttıkça, dijital oyun bağımlılığı seviyesi artar (16,17).

PUKİ

PUKİ, Buysse ve ark. tarafından (18) geliştirilmiş, Ağargün ve ark. (19) tarafından Türkçeye uyarlanmıştır. PUKİ, geçmiş bir aylık sürede uyku kalitesini ve bozukluğunu değerlendiren 19 maddeden oluşmaktadır. Ölçeğin puanlanan 18 sorusu, öznel uyku kalitesi, uyku latensi, uyku süresi, alışılmış uyku etkinliği, uyku bozukluğu, uyku ilacı kullanımı ve gündüz işlev bozukluğu olarak 7 bileşenden oluşur. Her bir bileşen 0-3 puan üzerinden değerlendirilir. Yedi bileşenin toplam puanı ölçek toplam puanını verir. Toplam puan 0-21 arasında değişir. Toplam puanın 5'ten büyük olması "kötü uyku kalitesini", 5 ve altında puan "iyi uyku kalitesini" gösterir.

İstatistiksel Analiz

Araştırmada elde edilen verilerin değerlendirmesi bilgisayar ortamında SPSS 21 For Windows bilgisayar paket programları ile yapıldı. Ölçeklerden alınan puanların normal dağılıma uygunluğu Kolmogorov-Smirnov testiyle yapılmış, ölçek toplam puanları normal dağılıma uymadığından ikili karşılaştırmalarda Mann-Whitney U testi, ikiden fazla değişkenlerde Kruskal-Wallis testi kullanılmıştır. Ayrıca bulguların değerlendirilmesinde tanımlayıcı istatistikler (ortalama, standart sapma, ortanca, minimum ve maksimum değerleri ve yüzdelik sayılar) ve korelasyon analizleri kullanıldı. Anlamlılık düzeyi $p<0,05$ kabul edildi.

Bulgular

Çalışmaya alınan ergenlerin yaş ortalaması 15,99±0,85 yıldır. Katılımcıların %59,9'unun erkek olduğu, %70,8'inin ailesinin

gelir durumunu orta olarak algıladıkları saptanmıştır. Ergenlerin %74'ünün evde kendilerine ait bilgisayarının olmadığı, %62,5'inin evde internet bağlantısının olmadığı, %86,9'unun akıllı telefona sahip olduğu ve %46,8'inin günlük 2 saatten fazla internet kullandığı belirlenmiştir. Çalışmaya katılan ergenlerin %78,5'inin bilgisayar, cep telefonu, tablet ya da oyun salonlarında dijital oyun oynadığı saptanmıştır. Dijital oyun oynayan ergenlerin %30,4'ü aksiyon/savaş türü oyun oynadığını, %42'si günlük oyun oynama süresini 1-2 saat olduğunu ifade etmişlerdir. Öğrencilerin %34,9'unun uyku kalitesinin kötü, %16,3'ünün oyun bağımlısı olduğu bulunmuştur (Tablo 1).

Araştırmada ergenlerin DOBÖ ortalama puanı 12,46±5,57 ve PUKİ ortalama puanı 4,72±2,53'tür. DOBÖ ve PUKİ puanları arasında pozitif yönlü, düşük düzey, istatistiksel olarak anlamlı bir ilişki vardır (r=0,157, p≤0,001). Ergenlerin dijital oyun bağımlılığı puanları arttıkça uyku kalitesi puanları da yükselmektedir (Tablo 2).

Çalışmaya katılan 14-15 yaş grubundakilerin PUKİ ortalama puanları daha yüksekken (p=0,002), DOBÖ ortalama puanları yaş değişkeninden etkilenmemiştir (p>0,05). Ergenlerin DOBÖ ortalama puanları erkeklerde daha yüksekken (p<0,001); PUKİ ortalama puanları da kızlarda daha yüksek bulunmuştur (p<0,001).

Ergenlerin kendine ait bilgisayar ve cep telefonu olma durumu, evde internet olma durumu grupları ile PUKİ ortanca puanları arasında farklılık görülmemektedir (p>0,05). Günlük internet kullanma süresi 2 saatten fazla olan ergenlerin PUKİ ortanca değerleri diğer gruplara göre daha yüksektir (p<0,001). Evinde internet bağlantısı olan, bilgisayar ve akıllı telefona sahip ve günlük internet kullanma süresi 2 saatten fazla olan ergenlerin DOBÖ ortalama puanları diğer gruplara göre daha yüksektir (p<0,05) (Tablo 3).

Tartışma

Bu araştırmada ergenlerde dijital oyun bağımlılığı ve uyku kalitesi arasındaki ilişki araştırılmış olup katılımcıların DOBÖ ve PUKİ puanları arasında pozitif yönlü, düşük düzey, istatistiksel olarak anlamlı bir ilişki olduğu sonucuna ulaşılmıştır (r=0,157, p≤0,001). Ergenlerin dijital oyun bağımlılığı puanları arttıkça uyku kalitesi puanları da yükselmekte ve artan puanlar kötü uyku kalitesini göstermektedir. Bu sonuçlar, uyku bozukluğunun ve problemli dijital oyun kullanımının ergenlerde sorun teşkil ettiği varsayımını desteklemektedir (5,20,21). Yapılan çalışmalarda da video oyunu oynama yoğunluğunun uyku kalitesi üzerinde olumsuz bir etkisi olduğunu ve kötüleşen uyku kalitesi için bir risk faktörü oluşturduğunu saptamışlardır (20,21). Ancak kötü uyku kalitesi sadece problemli dijital oyun oynama ile sınırlı değildir. Ancak dijital oyun oynamak ile kötü uyku kalitesi arasında bir ilişki olabilir.

DOBÖ'den elde edilebilecek puanlar 7 ile 35 arasında değiştiği göz önüne alındığında, araştırmada ergenlerin oyun bağımlılıklarının orta düzeyde olduğu görülmektedir. Arslan (22) tarafından yapılan bir araştırmada ortaöğretim öğrencileri arasında dijital oyun bağımlılıklarının orta düzeyde olduğu tespit edilmiştir. Literatürde ergenlerde oyun bağımlılığı oranı %2-15 arasında değişmektedir (5-8). Araştırmamızda dijital

Tablo 1. Ergenlerin tanıtıcı özellikleri

Özellikler	**n**	**%**
Yaş (Ort: 15,99±0,85)		
13-14 yaş	88	28,2
16-18 yaş	224	71,8
Cinsiyet		
Kız	125	40,1
Erkek	187	59,9
Algılanan gelir durumu		
Düşük	43	13,8
Orta	221	70,8
Yüksek	48	15,4
Evde bilgisayar olma durumu		
Evet	81	26,0
Hayır	231	74,0
Evde internet olma durumu		
Evet	117	37,5
Hayır	195	62,5
Akıllı telefona sahip olma durumu		
Evet	271	86,9
Hayır	41	13,1
Günlük internet kullanma süresi		
1 saatten az	22	7,1
1-2 saat	144	46,2
2 saatten fazla	146	46,8
Dijital oyun oynama durumu		
Evet	245	78,5
Hayır	67	21,5
En çok oynanan dijital oyun türü (n=245)		
Aksiyon/savaş	95	30,4
Spor	66	21,2
Taktik	84	26,9
Günlük oyun oynama süresi (n=245)		
1-2 saat	131	42,0
3-4 saat	64	20,5
5-6 saat	50	16,0
Oyun bağımlılığı durumu		
Bağımlı	51	16,3
Bağımlı değil	261	83,7
Uyku kalitesi		
İyi	203	65,1
Kötü	109	34,9
Toplam	312	100

Tablo 2. Dijital oyun bağımlılığı ile uyku kalitesi arasındaki ilişki

Değişken	**Min-maks**	**Ort ± SS**	**n**	**r***	**p**
DOBÖ-7	7-33	12,46±5,57	312	0,157	**0,006**
PUKİ	0-13	4,72±2,53			

*Spearman korelasyon analizi, SS: Standart sapma, DOBÖ: Dijital oyun bağımlılığı ölçeği, PUKİ: Pittsburgh uyku kalitesi indeksi

oyun bağımlılığı oranı %16,3'tür. Araştırmamızda elde ettiğimiz bu sonuç, diğer çalışma bulguları göre yüksek bulunmuştur. Bu durum oyun bağımlılığını ölçmek için kullanılan ölçüm aracı farklılıklarından, çalışmanın yapıldığı örneklem grubundaki ergenlerin çalışmaya karşı tutumları, anketleri doldurma titizliği, anket sorularına verdikleri yanıtların samimiyeti, çalışmaya alınan örneklem için dışlama kriterlerinden kaynaklanabilir.

Ergenlerin uyku kalitesi değerlendirildiğinde, ergenlerin %65,1'inin uyku kalitesinin iyi, %34,9'unun uyku kalitesinin kötü olduğu tespit edilmiştir. Ergenlerde uyku kalitesi ile ilgili olarak Türkiye'de yapılan çalışmalarda uyku problemlerinin giderek arttığı görülmektedir. Adölesanların %36,4 ile %54,7 arasında değişen oranlarda uyku kalitesinin kötü olduğu belirlenmiştir (23-25). Araştırmamızda ergenlerin uyku kalitesi diğer ergenler ile benzerlik göstermektedir.

Ergenlerde yaş gruplarına göre uyku kalitesi ve oyun bağımlılıkları incelendiğinde, oyun bağımlılık puanlarında yaş gruplarında fark yokken (p=0,083), uyku kalitesi puanlarının 16-18 yaş grubunda daha fazla olduğu belirlenmiştir (p=0,002). Yapılan bazı çalışmalar da yaş ve uyku kalitesi arasında istatistiksel olarak anlamlı bir ilişki olduğunu bildirmektedir (26-28).

Çalışmada cinsiyet ile uyku kalitesi ve dijital oyun bağımlılığı ölçek puanları açısından gruplar arasında istatistiksel olarak önemli fark bulunmuştur (p<0,001). Adölesan dönemde kızların erkeklere oranla daha yüksek oranda uyku kalitesinin kötü olduğunu gösteren çalışmalar bulunmaktadır (24,26). Bu çalışmada da benzer şekilde, uyku kalitesi kızlarda, erkeklere göre daha kötü olduğu bulunmuştur. Dijital oyun bağımlılığı araştırmaları incelendiğinde, erkeklerin kızlardan daha çok dijital oyun oynadıkları ve bu oyunlara daha fazla bağımlılık gösterdikleri belirtilmektedir (29-31). Bu çalışmada da erkeklerin dijital oyun bağımlılık puanlarının kızlara göre daha yüksek olduğu görülmüştür. Bu sonuç kız ve erkek öğrencilerin boş zaman aktivitelerine yönelik ilgilerinin farklılığından ve cinsiyete yönelik dijital oyun türlerinin farklılığından kaynaklanabileceği düşünülmektedir (32,33).

Yapılan çalışmalar, uykunun fiziksel aktivite, anksiyete, depresyon, internet ve akıllı telefon kullanımı, çevresel faktörler gibi birçok nedenden etkilendiğini göstermektedir (25). Ergenlerin evinde internet olması, kendisine ait bilgisayar ve telefon varlığı ile uyku kalitesi puanı arasında istatistiksel olarak fark bulunmamıştır. Günlük 2 saattten fazla internette zaman

Tablo 3. Ergenlerin tanıtıcı özelliklerine göre PUKİ ve DOBÖ-7 ölçek puan ortalamalarının dağılımı (n=312)

	PUKİ		**DOBÖ-7**	
	Ortalama ± SS	**Ortanca (Min-maks)**	**Ortalama ± SS**	**Ortanca (Min-maks)**
Yaş				
14-15 yaş	4±2,2	4 (0-10)	13,2±5,6	12 (7-28)
16-18 yaş	5±2,6	5 (0-13)	12,2±5,6	11 (7-33)
Test, p**	12,02-**0,002**		8,62-0,083	
Cinsiyet				
Kız	5,6±2,7	6 (0-13)	11±5,6	8 (7-29)
Erkek	4,1±2,3	4 (0-11)	13,4±5,3	12 (7-33)
Test, p**	7,89-<**0,001**		15,7-<**0,001**	
Evde kendine ait bilgisayar olma durumu				
Evet	5±2,7	5 (0-13)	13,4±5,2	13 (7-29)
Hayır	4,6±2,5	4 (0-12)	12,1±5,7	11 (7-33)
Test, p**	8,6-0,280		7,55-**0,009**	
Evde internet olma durumu				
Evet	4,8±2,8	5 (0-13)	13,9±5,5	13 (7-29)
Hayır	4,7±2,4	4 (0-12)	11,6±5,5	10 (7-33)
Test, p**	11,58-0,818		8,11-<**0.001**	
Akıllı telefona sahip olma durumu				
Evet	4,7±2,5	5 (0-13)	12,7±5,6	11 (7-33)
Hayır	4,8±2,6	4 (0-11)	10,9±4,9	9 (7-29)
Test, p**	5,46-0,863		4,39-**0,029**	
Günlük internet kullanma süresi				
1 saatten az	4,9±2,9	5 (0-11)[ab]	9,1±4,1	7 (7-23)[a]
1-2 saat	4,1±2,2	4 (0-12)[a]	10,9±4,2	10 (7-27)[a]
2 saatten fazla	5,4±2,6	5 (0-13)[b]	14,5±6,2	14 (7-33)[b]
Test, p*	17,74-<**0,001**		37,27-<**0,001**	

[a, b]: Her bir ölçüm için aynı harfe sahip gruplar arasında fark yoktur (Dunn testi), *: Kruskal-Wallis testi, **: Mann-Whitney U testi, SS: Standart sapma, DOBÖ: Dijital oyun bağımlılığı ölçeği, PUKİ: Pittsburgh uyku kalitesi indeksi

geçiren ergenlerin, daha az internette zaman geçirenlere göre daha fazla kötü uyku kalitesine sahip olduğu tespit edilmiştir. Aşırı ve zararlı internet kullanımı olarak tanımlanan internet bağımlılığı ile ilgili yapılan bir araştırmada da kötü uyku kalitesi ve internet bağımlılığının yaygın olarak birlikte olduğunu, internet bağımlılığı ile kötü uyku kalitesi arasındaki ilişkinin güçlü bir kanıtı olduğu belirtilmiştir (34). Ergenlerin oyun bağımlılık puanları incelendiğinde ise, kendine ait bilgisayarı, cep telefonu, evinde interneti olan ve günlük 2 saatten fazla internette zaman geçiren ergenlerin diğer gruplara göre oyun bağımlılık puanları anlamlı düzeyde yüksek bulunmuştur (hepsi için $p<0,05$) (Tablo 3). Bu gruplarda yer alan ergenlerin dijital araçlara erişim olanaklarının daha fazla olmasının bu durum üzerinde etkili olduğu düşünülmektedir. Günde 1 saatten az ve 2 saatten fazla internet kullanan ergenlerde PUKİ açısından istatistiksel olarak fark bulunmamıştır.

Araştırmanın Kısıtlılıkları

Çalışmada veriler sadece bir ilçe merkezinde bulunan öğrencilerle yapıldığından sonuçlar araştırma grubuna genellenebilir. Ergenlerde uyku kalitesini etkileyebilecek birçok faktör bulunmasına rağmen çalışmamızda kısıtlı faktörler araştırılmıştır. Örneğin, ergenlerin uyudukları odayı tek başlarına mı kullandıkları yoksa başkaları ile paylaşıp paylaşmamasının araştırılmaması çalışmamızın sınırlılığıdır.

Sonuç

Araştırmada; DOBÖ puanı yüksek olan ergenlerin PUKİ toplam puanları da yüksek olarak tespit edilmiştir. Aşırı ve kontrolsüz dijital oyun oynamanın ergenlerin uyku kaitesi üzerine yaptığı olumsuz etkiler konusunda farkında olunmalı, ergenler ve aileleri bu konuda bilgilendirmelidir. Aileler, sağlıklı dijital ekran kullanımı konusunda çocuklarını uyarmalıdır. Dijital oyun oynamanın ebeveyn kontrolünde olması ve sınırlanması gerekmektedir. Böylelikle ergenlerin oyun bağımlığı, uyku alışkanlıklarının takip edilmesiyle sorun belirlendiğinde tehlikeli boyutlara ulaşmadan önlem alınması sağlanabilir.

Etik

Etik Kurul Onayı: Araştırma öncesinde Gümüşhane Üniversitesi Etik Kurulu (14.01.2019 tarih ve 2019/1 sayılı) ve İl Milli Eğitim Müdürlüğü'nden (08.02.2019 tarih ve 2752035 sayılı olur) yazılı olarak izin alındı.
Hasta Onayı: Çalışmaya alınacak öğrencilere çalışmanın konusu ve uygulama hakkında bilgilendirme yapıldıktan sonra öğrencilerden bilgilendirilmiş onam alındı. Araştırmaya katılacak öğrencilerin kişisel bilgilerinin gizli olacağı ve araştırmada elde edilen bulguların araştırma dışında kullanılmayacağı konusunda açıklama yapılmıştır.
Hakem Değerlendirmesi: Editörler kurulu dışında olan kişiler tarafından değerlendirilmiştir.

Yazarlık Katkıları

Konsept: B.T., B.G., Dizayn: B.T., B.G., Veri Toplama veya İşleme: B.T., B.G., Analiz veya Yorumlama: B.T., B.G., Yazan: B.T., B.G.
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Hipersomni Etiyolojisinde Nadir Karşılaşılan Bir Neden, Fenprobamat: Olgu Sunumu

Phenprobamate as a Rare Cause of Hypersomnia: A Case Report

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Öz

Gündüz aşırı uykululuk (GAU), klinik pratikte sık görülen yakınmalardan biridir. GAU ile başvuran hastalarda, basit önerilerle çözümlenebilecek nedenler de dahil, sorgulanması gereken birçok etiyolojik neden bulunmaktadır. Biz bu olgu sunumunda GAU yakınması ile başvuran, 70 yaşında erkek hastadaki etiyolojik nedenleri, uyku sorgulanmasındaki tanıya gidiş basamaklarını ve sonucunu literatür eşliğinde tartışmayı amaçladık. İleri yaştaki bireylerde direkt veya indirekt olarak santral etki yapabilecek ilaçları önerirken, yan etkileri ve mekanizmalarının gözden geçirilmesi gerekmektedir.

Anahtar Kelimeler: Gündüz aşırı uykululuk, hipersomni, uyku, kas gevşetici

Abstract

Excessive daytime sleepiness (EDS) is a common complaint encountered in clinical practice. Numerous etiological factors require investigation in patients who present with EDS, including those that can be resolved via simple recommendations. This study reports a case of a 70-year-old man presenting with EDS. The possible etiological causes and diagnostic steps from sleep interrogation to the results with regard to previous literature was discussed. The side effects and mechanisms of drugs should be investigated for direct or indirect central effects in elderly individuals.

Keywords: Excessive daytime sleepiness, hypersomnia, sleep, muscle relaxant

Giriş

Gündüz aşırı uykululuk (GAU), gün içerisinde uyanık ve aktif kalınması gereken dönemde istem dışı uyuklama isteği veya uyuklama durumudur (1). Toplumun %5-20'sinde bu yakınma ile karşılaşılmaktadır (2). Ülkemizde ise GAU, %5,4 oranında bildirilmiştir (2). GAU en sık nedenleri içerisinde uyku ilişkili solunumsal bozukluklar, santral nedenli uyku bozuklukları, sirkadiyen ritm bozuklukları, ilaç kullanımı, medikal durumlar, psikiyatrik bozukluklar sayılabilir (3).

GAU, altta yatabilecek nedenlerin çeşitliliği ve aşırı uykuluk durumuyla doğabilecek potansiyel tehlikeler ve sonuçlar (kaza, verimlilik azalması vb.) nedeniyle sık karşılaşılan önemli bir sağlık sorunudur.

İlaç kullanımı GAU etiyolojisinde öyküde sorgulanması gereken faktörlerden biridir. Toplumda azımsanmayacak sıklıkta kullanıldığı ve GAU haline neden olabilen ve en çok bilinen ilaçlar içinde alfa adrenerjik blokerler, antikonvülzanlar, antidepresanlar, H1 reseptör blokerleri, opioidler, antiemetikler, beta blokerler, antimuskarinik ve antispasmotikler, antipsikotikler bulunmaktadır (4,5). Ancak daha nadir kullanılan ilaçlar poliklinik şartlarında göz ardı edilebilmektedir.

Burada GAU neden olan nadir bir etkeni tanımlamak ve literatür eşliğinde tartışmak istedik.

Olgu Sunumu

Bilinen sistemik hastalığı olmayan 70 yaşında erkek hasta, kliniğimize, gün içerisinde aşırı uykululuk yakınması ile başvurdu. Öyküsünde, yakınmalarının 2011 yılında başladığı, oturur pozisyona ya da istirahat pozisyonuna geçer geçmez uyuklamalarının olduğu, uykuya direnemediği 15-30 dk kadar uyuduktan sonra kendiliğinden uyanmadığı, uyandığında/uyandırıldığında uykululuk halinin devam ettiği, gece uzun saatler uyusa dahi ertesi gün, gün içinde istirahat halinde iken tekrar uyukladığı öğrenildi. Yakınları tarafından horlamasının olduğu, tanıklı apnesinin olmadığı belirtildi. Hasta bazen sabahları yorgun kalktığını, nadiren sabah uyandığında başının tepe kısmında sıkıştırıcı tarzda ağrısının olduğunu, ağız kuruluğu, sialore, baş boyunda terleme yakınmasının nadiren olduğu, nokturisinin olmadığını belirtti. Bununla birlikte katapleksi atağı, uyku paralizisi, halüsinasyon gibi bulgular tariflememekteydi. Ayrıca, 2011 yılında boyun ağrıları nedeni ile yapılan incelemelerinde servikal bölgede disk hernisi saptandığı,

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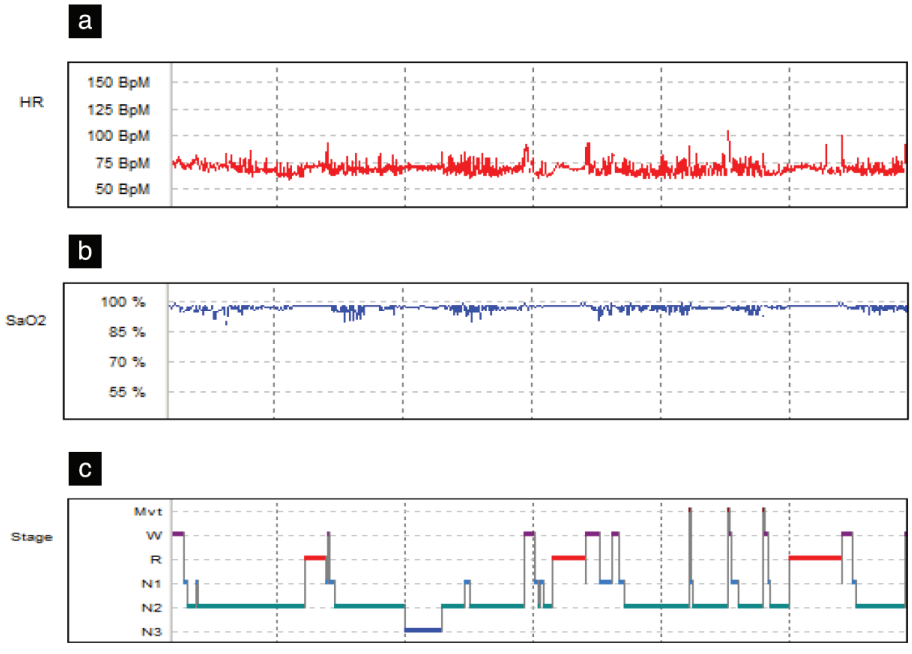
kas ağrıları için 2011 yılında fenprobamat 400 mg/gün + parasetamol 400 mg/gün içeren preparat başlandığı, 9 yıldır her gün kullanmakta olduğu öğrenildi.
Özgeçmişinde 40 paket-yıl sigara kullanımı mevcuttu. Nörolojik muayenesinde bir patoloji saptanmadı.
Laboratuvar incelemeleri: Epworth uykululuk skalası skoru (EUS): 19/24, vücut kitle indeksi: 20 kg/m^2. Rutin hemogram, tiroid uyarıcı hormon, ferritin, vitamin B12 tetkiklerinde bir patoloji saptanmadı. Birinci polisomnografi (PSG) incelemesinde; uyku latansı: 6,5 dk, REM latansı: 56 dk, uyku etkinliği: %90,5, uyku devamlılığı: %92,4, uyanma sıklığı: 8 kez/gece, REM epizodu: 3/gece. Apne-hipopne indeksi (AHİ): 25,3/st, minumum O_2 satürasyonu: %88 olarak belirlendi (Grafik 1). PSG sonrasında AHİ: 25,3/st çıkması nedeni ile çoklu uyku latans testi (ÇULT) yapılmadı. Takipte fenprobamat ilacı kesildikten sonra kontrol PSG planlandı. İkinci PSG incelemesinde uyku latansı 13,5/dk, uyku etkinliği %66,1, REM epizodu 4/gece, AHİ: 6/st, minimum O_2 satürasyonu %89 olarak belirlendi (Grafik 2).

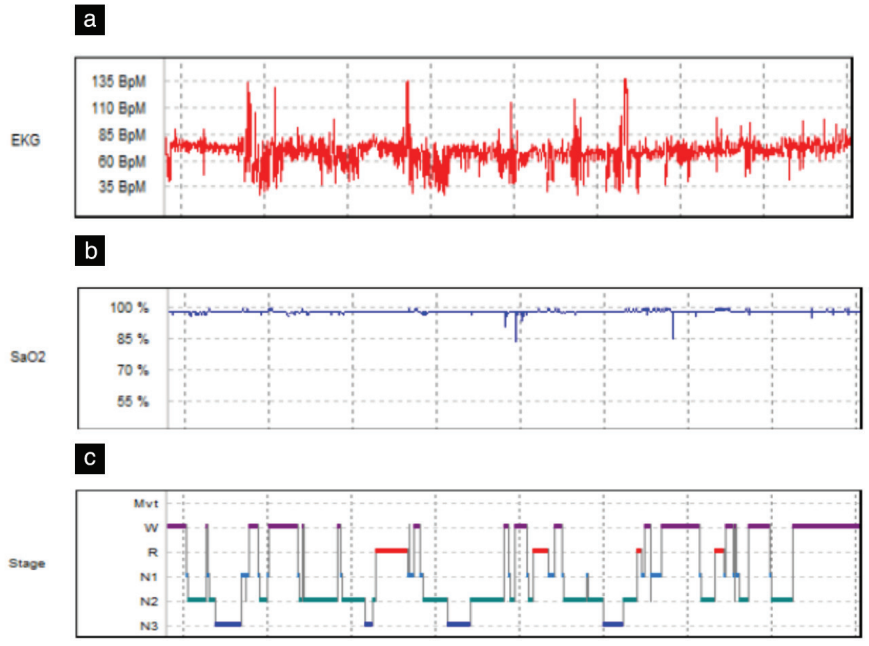
Tartışma

GAU, etiyolojik spektrumu geniş olması mortatilite nedeni olabileceği gibi hayat kalitesinin düşmesi, iş performansı ve kazalara neden olarak bireysel ve toplumsal kalitatif ve kantitatif bir çok kayıplara neden olmaktadır (6-8).
GAU'nun sübjektif ve objektif şekilde ölçülebilmesi bazı testler ile mümkündür. Elektroensefalografi, PSG ve ÇULT objektif yöntemler iken, EUS ve Stanford uykululuk skalası en sık kullanılan sübjektif testlerdendir (9,10).
Hastamızda GAU nedenini irdelemek için PSG incelemesi ve gece kaydı sonrası, PSG sonucuna göre gerekirse ÇULT yapılması planlandı. Hastanın semptomlarının başlama yaşı ve öyküsü göz önüne alındığında idiyopatik hipersomniler düşünülmedi. Bununla birlikte öyküsü uygun olmamakla birlikte nadir de olsa ayırıcı tanıda tip 2 narkolepsiyi dışlamak için ÇULT planlanmıştı. İlk gece PSG'de AHİ: 25,3/st çıkması nedeni ile ÇULT yapılmadı. Uykululuğa neden olabilecek metabolik ve sistemik hastalık bulgularının olmaması ya da ileri yaşta ortaya çıkabilecek olan kognitif bozukluklarla birliktelik gösteren sirkadiyen ritim bozukluğuna klinik bulguların olmaması nedeni ile bu etiyolojiler dışlandı.
Hastamızda EUS 19/24 olarak belirlenmişti. EUS sübjektif bir inceleme yöntemi olup, obstrüktif uyku apneli (OUAS) hastaların AHİ ağırlığı ve satürasyon düşüklüğü ile net olarak örtüşmediği ancak ÇULT ile korele olduğu bilinmektedir (11). EUS aynı zamanda akut gelişen uykululuk hali için de kullanılamamaktadır (12). Hastamızda AHİ: 25,3/st olup, EUS skorunun oldukça yüksek olduğu görülmüştür.
Hastanın yakınmalarının başladığı dönem için kesin bir süreç tanımlaması ve 9 yıl süre ile yakınmalarında progresyon ya da dalgalanma göstermemesi, yeni eşlikçi semptom eşlik etmemesi nedeni ile yakınmaların kullanmakta olduğu ilaç ile ilişkili olduğu düşünüldü.
İlaçların çoğunun sedatif etki oluşturarak (13), hava yolu kaslarını, uyku ilişkili solunum kaslarını indirekt yolla gevşetmesi ya da üst hava yolları ile interkostal kaslar ve diyafragmatik kasların koordinasyonsuz çalışmasını tetiklemesi (14), bazı hipnosedatiflerin ise karbondioksite yanıtı baskılayıp, üst hava yolu kaslarının gevşemesi (15,16) ile OUAS'ye neden olabileceği, sonrasında GAU hali ile sonuçlanabileceği bilinmektedir.



Grafik 1. Fenprobamat tedavisi altında yapılan polisomnografik inceleme ait histogramlar
Birinci PSG'de nabız (a), oksijen satürasyon (b) uyku evreleri (c) histogramları

PSG: Polisomnografi



Grafik 2. Fenprobamat tedavisi kesildikten sonra yapılan polisomnografik inceleme ait histogramlar
İkinci PSG'de nabız (a), oksijen satürasyonları (b) uyku evreleri (c) histogramları

PSG: Polisomnografi, EKG: Ekokardiyografi

Miyorelaksan ilaçlar, kas ağrıları ve spastisite nedeni ile nöroloji, fizik tedavi ve rehabilitasyon, ortopedi ve beyin cerrahisi kliniklerince sıkça kullanılmaktadır. Santral etkili kas gevşeticiler, santral sinir sisteminde internöronal sinaps geçişlerini engelleyerek kas gevşetici etkilerini oluşturmaktadırlar (17). Bunların arasında sık kullanılan ilaçlar ise; baklofen, siklobenzaprin, karisoprodol, meprobamat, metokarbamol, klorzoksazon, metoksalon, orfenadrin, benzodiazepinler ve tizanidin bulunmaktadır.

Fenprobamat santral etkili, sedatif, anksiyolitik ve antikonvülzan etkileri olan bir kas gevşeticidir. Etki mekanizması meprobamat ile benzerdir. Kesin etki mekanizması bilinmemekle birlikte, hayvan deneylerinde santral sinir sisteminde GABA-A reseptörlerine bağlanarak retiküler formasyondaki ve spinal kordda nöronal iletiyi azaltıp sedasyona ve diğer etkilerine neden olduğu gösterilmiştir. Amerika'da 1960'larda kısa etkili anksiyolitik olarak kullanılmaya başlandıysa da, sonrasında sedatif ve bağımlılık yapıcı etkilerinin keşfedilmesiyle kullanımı azaltılmıştır (18,19). Hastamızın servikal bölgede disk hernisi ve kas ağrıları için 2011 yılından beri fenprobamat 400 mg/gün kullanmakta olduğu öğrenildi. GAU yakınmaları benzer tarihte başlamıştı. PSG sonrası gerekli öneriler sonrası hasta ilaçlarını kesti. Takipte uykululuk yakınmasının kalmadığı (EUS: 2/24) ancak boyun ağrıları nedeni ile sık uyandığı öğrenildi.

Sonuç olarak özellikle ileri yaşta, GAU yakınmasıyla başvuran hastalarda, ilaçların ayrıntılı sorgulanması ve reseptör düzeyinde etkilerinin gözden geçirilmesi, özellikle benzodiazepin ve türevlerinin başta olmak üzere, yaşlı grupta kullanıldığında yan etkileri konusunda dikkat edilmesi gerekmektedir.

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